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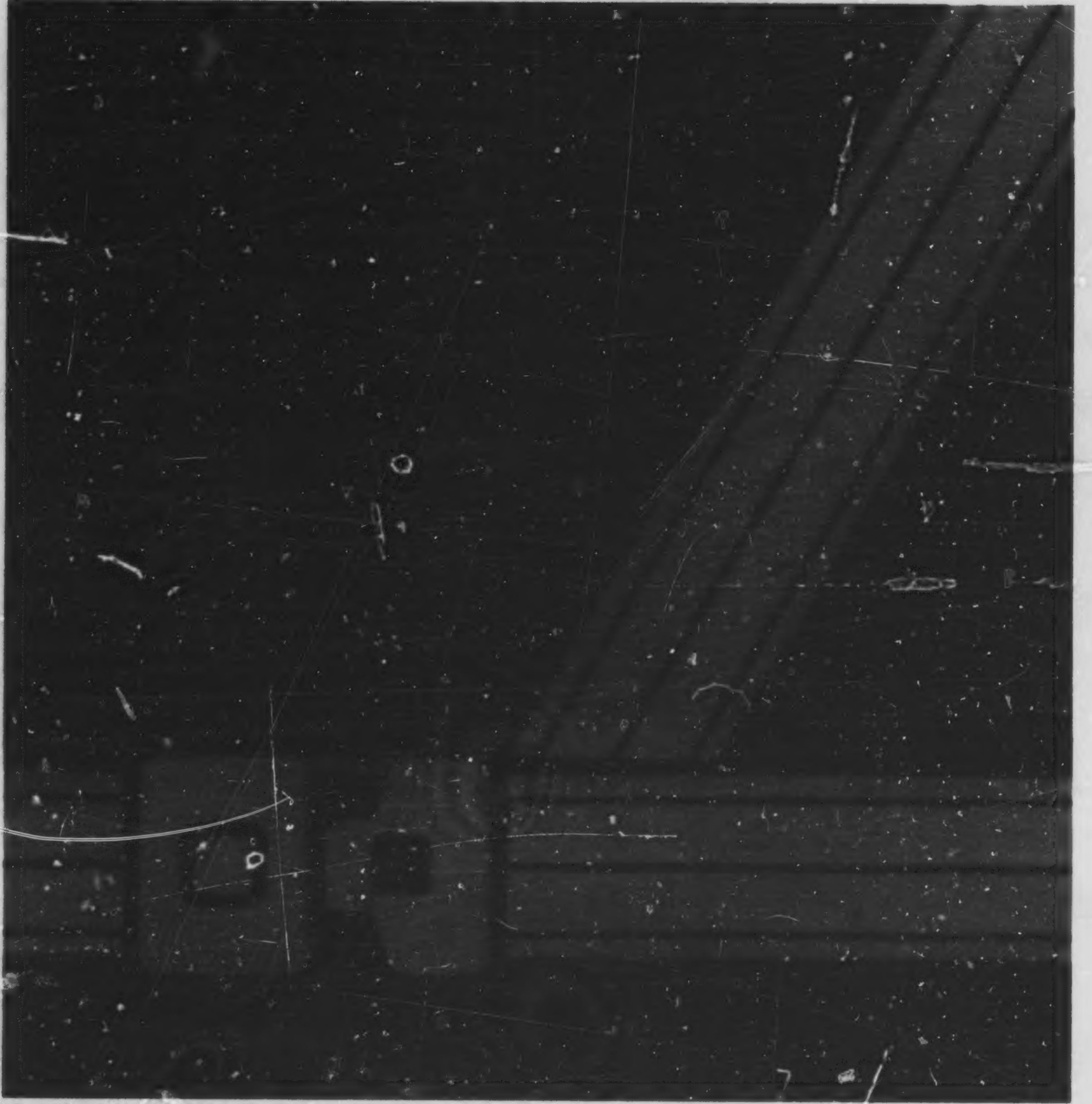
The Use of Economic Incentives and Public Education to Increase Seat Belt Use in a Community

March 1984



The Use of Economic Incentives and Public Education to Increase Seat Belt Use in a Community

Final Report
March 1984

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The Village Companies

Jim Heavner, Kay Norris, Lu Stevens and Mark Meares, along with many other members of the Village Company family, provided extensive assistance throughout the entire campaign.

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CHAPTER 1. INTRODUCTION AND RATIONALE

Background

The use of lap or lap/shoulder belts by U.S. drivers and passengers has always been rather low. Latest data from a continuing 19 city survey show a 14 percent use rate (NHTSA, 1983). This low rate exists despite persuasive evidence of belt effectiveness in reducing death and injury. The University of North Carolina Highway Safety Research Center (HSRC) estimates that belts could prevent 60-65 percent of deaths now sustained by unbelted front seat occupants (Campbell and Reinfurt, 1979). Belts are also highly beneficial for rear seat occupants.

In this country, efforts to increase belt use through a variety of public information programs have shown relatively little success. Some such efforts have shown no effect at all, while others have shown rather modest increases in wearing rates (Nichols, 1982).

Surveys conducted to identify reasons for belt use and non-use indicate that many respondents do not understand how belts work or the risks of being unbelted. Also, some respond negatively to belts from fear of entrapment, discomfort, etc. (Nichols, 1982).

One might wonder whether the reasons given by these respondents are truly valid. One hypothesis is that people do not think about belts one way or the other when they get into a vehicle, and it is only when surveyed that they ponder the issue and feel they must offer some kind of a rationale to justify their actions, such as the fear of entrapment, etc.

Thus, regular wearers may not go through a conscious decision process when they get into a vehicle--they just buckle up from habit. Likewise, perhaps non-wearers also just enter the vehicle and drive away without thinking about belts one way or the other. If so, this seeming indifference may actually be grounds for encouragement, because it may mean that the behavior of buckling up will be easier to induce than if some deep felt conviction first had to be overcome.

Study Approach

In view of the foregoing, as well as previous research which has demonstrated the effectiveness of economic incentives in increasing belt use (Geller, 1982), HSRC designed a campaign centered around the idea of giving out incentives for belt wearing. This was done in conjunction with an extensive public education effort. The six-month incentive effort covered the communities of Chapel Hill and Carrboro, North Carolina, and was entitled "Seat Belts Pay Off." The title reflected both the educational and economic themes. The approach was to stop vehicles at random and to give all belted vehicle occupants a small prize (and a chance for a large cash prize).

The rationale was that cash or prize incentives, in combination with extensive public education, would more effectively induce belt wearing than the latter alone. This is because the prizes would serve as a reinforcement or reward for belt wearers, and serve as an incentive to buckle up for those who might know of the contest but had not been stopped. This approach was designed to make people think about buckling up often enough to encourage a regular belt use habit to develop.

There is sound scientific underpinning for this approach based on half a century of studies of human and animal behavior. It has been demonstrated repeatedly that a given behavior can be strengthened if rewards are forthcoming in a manner consistent with principles of learning. These principles have been applied in literally thousands of studies covering a wide range of research in areas of defense, space, psychiatry, commercial animal training, education, work productivity and many more. It is not surprising that this concept has been applied successfully in several efforts to increase belt wearing, and some recent examples are reviewed in the next chapter.

Thus, project goals were to increase public awareness of seat belts as an issue, and to increase belt wearing rates in accidents and in the population at risk.

Figure 1.1. Campaign logo.

Study Organization

The effort was sequenced as follows:

1. Pre-campaign activities: Before making the effort public, HSRC collected baseline belt use data, and sought and received support from many community leaders.

2. Educational phase: For three weeks a rather intensive public education effort was mounted in which reasons were given for belt use, but no reference was made to the incentive phase to come. The information was presented in the form of printed advertisements and radio and cable television public service announcements.

3. Incentive phase: For six months, with intense continuing public education, incentives (valued at $3-$5) were given to belted motorists stopped at random. Monthly $500 drawings were held, capped by a $1,000 drawing at the end of the six months.

4. Follow-up phase: For about one year, HSRC will continue to monitor belt use in the community with continuing, though reduced, public education. This report reflects belt use about two months into the follow-up period.

CHAPTER 2. REVIEW OF OTHER APPROACHES TO INCREASING BELT USE

Background

Given the demonstrated effectiveness of restraint systems in reducing serious injury and death, the persistent low usage rates have been a source of frustration. Many attempts have been made to increase restraint use. Nichols (1982) categorized efforts to date:

1. Public information (mass media) campaigns.
2. Educational programs for specific target audiences.
3. Child safety seat distribution programs.
4. Incentive programs which reward safety belt usage.
5. Organizational safety belt use policies.
6. Safety belt and child restraint use legislation.

Of particular interest to this report are the findings of previous public information and education efforts as well as earlier incentive efforts. Mandatory use policies and their implications will be addressed in the Discussion Chapter. In order to provide background for the combination approach implemented in Chapel Hill and Carrboro, the following sections focus on various previous efforts tried with the goal of increasing restraint use.

Public Education Efforts

Public education sometimes results in moderate increases in belt use. Included here are mass media campaigns, elementary and high school education programs, use of the seat belt "convincer," child restraint efforts, etc. Results suggest modest behavior changes in some cases. Yet for the most part, the effects have been minimal and there have been no significant lasting effects beyond the time period in which the treatment occurred (Nichols, 1982).

Incentive Attempts

In the last few years, numerous seat belt incentive programs have been conducted in the United States. Some are very well documented, while for others there is no documentation. The following sections highlight some of these efforts, first focusing on corporate or institutional settings and following with some community-based examples.

1. Closed Settings

Closed settings, such as corporations or institutions, are excellent locations to initiate seat belt incentive programs. This primarily results from the control present at these sites -- control of traffic, control of information passed on to the participants at various stages in the campaign, etc. In addition, such settings sometimes lend themselves to record keeping, and these corporations can view the benefits of fewer employee sick days, lower disability payments, decreased insurance costs, etc., that result when the work force uses available safety belts. Some well-documented case studies are presented below.

- Dupont. At Berg Electronics, a Dupont plant in Fishing Creek, Pennsylvania, a 1980 seat belt campaign featured incentives of catalog gifts valued at $12-$15 (Spoonhour, n.d.). The contingency was that the 900 company employees had to reach a target of 90 percent belt use during two months of a six-month campaign. From an estimated baseline use rate of 46 percent, the 90 percent target was reached in the second and third months of the contest.

  A number of promotional items kept this program highly visible to employees, including bulletin board messages, signs in parking lots, costumed characters (e.g., "Easter Bunnies"), films, letters, news coverage, etc. Small prizes were also passed out periodically to belt wearers passing a check point. These prizes included candy "kisses," a tire safety kit, carnations for the men and orchids for the women at Easter time, etc. Total cost of this effort was around $24,000.

- General Motors. In May of 1982, the "Seat Belt Sweepstakes" was initiated at the GM Technical Center in Warren Michigan (Le Roux, 1982; General Motors Corporation, 1982; Geller, 1982). In another group contingency procedure, three new automobiles were to be awarded through a drawing if employees reached three progressively higher belt use levels. To be eligible to participate in the

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drawing, employees had to sign a pledge card whereby they agreed to wear their seat belts for the next year. Five thousand of the 6,000 employees signed the pledge.

From a baseline use rate of 36 percent, goals were set at 50 percent use for the first month, 65 percent for the second month, and 70 percent sustained daily average use over a three month period. All three goals were reached and the automobiles awarded. Smaller prizes such as watches, travel alarm clocks, pen watches, etc., were also raffled along with the automobiles. Prizes for the sweepstakes were slightly in excess of $30,000.

o Southwest Virginia. Under the direction of Dr. E. Scott Geller, a behavioral psychologist at Virginia Polytechnic Institute and State University (VPI), several positive incentive efforts have recently been conducted in the southwestern part of the State of Virginia (Geller, 1982). Geller and colleagues developed and field tested incentive strategies on the campus of VPI and in the Blacksburg community. These strategies were then extended to industrial settings as part of a contract for the U.S. Department of Transportation.

At Federal Mogul, a manufacturer of engine bearings, fliers explaining the reward program were given to entering drivers. The program then involved a "combination game" whereby belted drivers received game symbols. Unbelted drivers received fliers without a symbol. Certain combinations of symbols allowed drivers to receive certain prizes, many of which were donated by local merchants. White-collar workers increased their belt use from 17 percent to around 25 percent during the contest, while blue-collar workers showed little improvement (use rates generally 3 to 7 percent).

At Radford Ammunition Plant, a single reward was given to an individual driver each day for three consecutive weeks. The technique was randomly to select a winning license plate from those vehicles whose drivers were wearing a shoulder belt. Prizes were two tickets to an upcoming VPI basketball game or dinner for two at a local restaurant. Mean usage increased from around 7 percent during pre-treatment to around 23 percent during the contest phase. The average follow-up rate was 16 percent.

The strategy varied slightly for the incentive effort at Harvey Hubbell Lighting, Inc. Here, blue-collar workers participated in awareness sessions that concentrated on the effectiveness of safety belts as well as the ground rules for the upcoming incentive phase. White collar workers did not receive awareness sessions.

Cash drawings were held on four consecutive Mondays. Eligible participants were those drivers seen wearing shoulder belts during morning and afternoon peak traffic. License plates were entered for each time the driver was shoulder belted. The amount of cash

> awarded was equal to the mean belt use for the winner's work group (either blue or white collar).
>
> The awareness sessions tripled the shoulder belt wearing rate for blue-collar workers, and the follow-on raffle strategy then doubled this rate (i.e., total gain from 6 percent to 44 percent). White collar belt use also doubled during the raffles. The modest sum of $154 was spent on cash rewards.

The Highway Safety Research Center has also been active in expoloring the use of incentives to increase seat belt usage. Pilot projects were conducted at Chapel Hill High School (CHHS) and the corporate headquarters of Blue Cross and Blue Shield of North Carolina (BCBS) (Campbell, Hunter, Stewart and Stutts, 1982). These efforts were similar in scope and results. In both projects, $1800 was available for positive incentives. Over a one-month period, 300 coupons redeemable for $5 were given to properly restrained occupants in randomly selected vehicles. Eligible participants were students, faculty and staff at CHHS and employees at BCBS. In addition, $300 worth of gift certificates were given the winner of a drawing consisting of previous winners. Awards could be made at any time of the day but generally corresponded with peak traffic situations.

Educational efforts preceded both incentive phases. At CHHS, simultaneous presentations were made to the sophomore, junior and senior classes. At BCBS, groups of employees were exposed to seat belt educational presentations over the course of two weeks. The primary educational component was viewing film clips of anthropomorphic dummies in staged crashes, both with and without belts.

Driver shoulder belt use data were collected during baseline, education, incentive and follow-up (post incentive) phases. Mean rates by phase are shown below:

	Baseline	Education	Incentive	Follow-up
CHHS	20%	34%	53%	36%
BCBS	8%	28%	56%	25%

At both locations, shoulder belt use peaked at about 70 percent during the incentive phase. Follow-up rates were considerably higher than baseline.

2. Community Efforts

Multi-phased community wide programs to increase belt use are underway in several communities, but most of these are in the planning stage and have no reported results. Some, however, are far enough along to describe:

- Helena, Montana. This state capitol town of about 30,000 began an incentive program in February of 1983, about two months before the Chapel Hill effort began. The program was sponsored by the state Governor's Highway Safety Office and the local Chamber of Commerce. About 10,000 small incentives were obtained to give out to motorists over a one year period, supplemented with handsome monthly prizes such as color TV sets, microwave ovens, etc. At the end of a year a new car will be awarded as a grand prize. There is continuing public information activity throughout this effort.

  Project officials reported four percent baseline belt use with a growth to 19 percent in October, 1983. These figures include a lap belt "add-on" figure because the observation method was confined to observing shoulder belt use, thus precluding direct observation of lap belt use alone. The lap add-on was estimated at 20 percent -- somewhat higher than the 11 percent add-on determined to be appropriate in Chapel Hill (see Chapter 6 for details). On the other hand, the Helena sampling includes essentially all vehicles except for large trucks and buses. Thus, many vehicles with no shoulder belts are counted. For example, earlier models of pickup trucks, vans, and utility vehicles often have lap belts only. Inclusion of these vehicles necessarily reduces the shoulder belt percent observable, which in turn would appear to warrant the higher lap belt add-on factor.

  Data are collected at 10 sites per month, yielding about 1500 observations per month. The data collection is done during 2-3 days each month with data taken at differing times of the day.

- Jackson, Mississippi. In 1983 a campaign was undertaken involving the Governor's Highway Safety Program, a local Ford dealer, and a leading radio station. Publicity emphasized that wearing seat belts could result in winning a car as well as saving one's life. To have a chance of winning, a motorist had to secure and display a bumper sticker, and also be listening to the sponsoring radio station.

A "phantom car," driven by campaign staff, cruised around town spotting bumper-stickered cars in which the driver was belted. The spotter then called the radio station which in turn broadcast the license plate number of the car spotted. The belted driver then was to call the radio station and confirm the license plate number to be entered in the drawing for the new car.

Project staff reported baseline shoulder belt use at six percent. During the relatively short campaign the rate was reported to have increased to 12 percent, and afterwards slipped back to 6 percent. Note that this modest percentage change is, however, applied to a very large population of nearly a half million people; thus, it would appear that some 25,000 or so motorists may have changed their belt wearing behavior during the incentive phase.

- Waynesville, North Carolina. A local Kiwanis Club undertook an incentive program in this small (population 7,000) N.C. mountain community. Casual baseline data revealed 2-4 percent shoulder belt use. Club members arranged publicity and, through cooperation of local McDonalds restaurants, received a few hundred certificates for hamburgers. These were given out intermittently to belted motorists around town. It does not appear that a discernible change in belt use occurred. Last summer, several months into the campaign, 200 cars were tallied in the downtown area, and 2 percent belt use was noted.

- Wilson, North Carolina. Once again, a local Kiwanis Club conducted a one-month incentive program in this Eastern N.C. tobacco town (population 63,000). During November 1983, a few hundred incentives (hamburgers, watches, etc) were awarded. The organizers report receiving good publicity, but had early difficulties giving out the day's "ration" of incentives because so few people were belted. Baseline shoulder belt use was 2-4 percent. Usage rates following awards are not available.

Differing Ways of Determining Winners

Note that in the several incentive projects described above, there was significant variation in the "rules" by which one could win. Thus, in the case of Dupont and General Motors an element of group compliance was necessary before any individual could win. This set the stage for peer pressure toward compliance (i.e., "if you don't buckle up you are hurting my chances to win.")

There were also important differences in the DuPont and General Motors programs. In the case of DuPont, cooperation to attain the group goal led everyone to win a relatively modest prize. In contrast, the General Motors group goal attainment triggered a drawing which allowed one person to win a valuable prize.

In the GM case, the probability of winning the car was about one in 6,000, whereas in the DuPont case there was certainty of reward once the respective group goals were reached. Interestingly, in both cases very high wearing rates were achieved despite the vast difference in prize magnitude and probability of winning.

In the Jackson, Mississippi effort, the probability of winning was also quite low, and one had to take several steps to have a chance to win: (1) display a bumper sticker, (2) be listening to a certain radio station, (3) be belted, (4) be spotted, and (5) call in. This approach did not seem to produce much percentage change in belt wearing, but the program was rather short-term.

Clearly there are several ways such an effort can be handled, and any of several approaches seems to work reasonably well. It is not yet clear which is best, and it may be that the exact incentive scheme is less important than the overall context of intensive public education plus enough incentives to make people think about buckling up when they get into their vehicles. If so, this is most fortunate, since the amount and nature of available incentives will surely vary from place to place. This gives reason to hope that an effective campaign format can be found to match most any available selection of incentives.

CHAPTER 3. SELECTING THE COMMUNITY AND PRE-CAMPAIGN ACTIVITIES

Community Selection

The overriding reason for conducting this campaign in the Chapel Hill/Carrboro area is the fact that HSRC is located here. Considering the necessity for daily data collection, incentive giving, and frequent contact with community officials, media representatives etc., an effort in a distant community did not seem feasible.

Chapel Hill and Carrboro are adjacent communities with about 50,000 residents. Chapel Hill is the home of the University of North Carolina at Chapel Hill with about 22,000 students. There is no heavy industry in the community, and the area is somewhat dominated by UNC students, faculty and the support businesses typical in such a community. A substantial number of retired persons reside in the area. The cost of living in Chapel Hill is near the highest in the state.

Other factors also support the decision to conduct the campaign locally. The fact that there are many young people in this community means that there are a large number of high risk drivers. There is a history of pilot efforts here, where incentive techniques were tried at the local high school and the nearby state headquarters of a large health insurance company (Campbell, Hunter, Stewart, and Stutts, 1982). Also, the higher socioeconomic and educational level that prevails in the community seemed likely to improve chances for success.

There are, of course, some corresponding disadvantages to selecting this community. First, this university community is not typical of North Carolina towns; thus, it does not necessarily follow that the same program would produce the exact same results elsewhere in the state.

Second, the community was highly mobile during the incentive phase. A few weeks into the campaign, spring semester ended and some 20,000 students left town. For the next two months of summer school a smaller student body of about 6,000 was in town, many of whom were not regular session students. Also, many UNC summer workshops and institutes bring people in and out of town for short periods. Finally, late in August, the full student body returned minus several thousand graduating seniors plus several thousand new freshmen.

The constituency of this community is thus more changeable than would be true in many communities. This meant that the publicity had to be restarted (or "re-charged") several times. Even so there was a problem in "reaching" all community residents.

Pre-campaign Activities

Before the campaign began, much planning was required, and this planning reflected the dual nature of the effort -- a community health campaign and a research project. In the early stages considerable time was devoted to contacting and seeking the support of community leaders -- ranking University officials, town government and police officials, business leaders, media representatives, etc. In general, the reception was good, which translated in several cases into formal statements of endorsement.

Many hours were spent planning data collection and incentive giving. Both data and incentive sites had to be selected. The process of giving incentives and cash prizes was planned, involving considerations such as:

1. Who would be stopped? All vehicles? Random sample?
2. Would remote observations be used (i.e., recording license plates of belted occupants?)
3. What would constitute the entry for the drawing? A card filled out at the site? A mail-in?

4. How often would incentives be given? Daily? Weekly?

Additional planning concerned preparation of brochures, bumper stickers, etc. In summary, unusual effort was devoted to planning this project. The following chapters show the results of this planning activity.

CHAPTER 4. OBTAINING AND DISTRIBUTING INCENTIVES

Seeking Incentives

Donations for incentives were requested from a variety of businesses and civic organizations. Requests were made to local as opposed to national groups since the campaign focus was local. In approaching business officials to contribute incentives, HSRC characterized the process as one in which they could promote their business products while tying into a worthwhile community goal.

More specifically, HSRC pointed out that many businesses give away samples, prizes etc., as a normal part of promoting their products. We suggested instead of giving out these products randomly to "the man on the street," that they allow HSRC to distribute the products to people wearing seat belts.

As a specific example, the Coca-Cola Bottling Company contributed 1200 six-can containers of soft drinks. They provided the drinks and HSRC provided the labor in distributing the soft drinks to the 1200 seat belted "winners." The Coca-Cola company received the product promotion and community service recognition, 1200 belted occupants received a reward, and the campaign received the promotion benefit.

Thus, the campaign was arranged so that businesses could realize an enlightened self interest as well as serving the community interest. We believe this combination increases the chance that a business will invest part of its "promotion dollar" in a seat belt incentive campaign.

Civic organizations and two University foundations were approached in much the same way. Presentations were made, and their support was requested. Relative to their size, generous donations were received from several such groups which added to the community participation.

Liaison with a Media Company

A most fortunate feature of the "Seat Belts Pay Off" campaign was the early and enthusiastic participation of The Village Companies, a community business that owns the largest local AM radio station, the cable TV franchise in Chapel Hill (but not Carrboro), and publishes the Village Advocate, a shopper's newspaper delivered free twice a week to all residences in the two communities. These Village Companies components played a major role in efforts to initiate and sustain public awareness as is described elsewhere. Of more immediate concern here is the company's role in securing business cooperation in providing incentives used in the campaign.

Prior to early meetings with Village Companies officials, HSRC had assumed that incentive contributions would be secured by "hitting the streets" to meet with scores of individual business officials from who support would be solicited. Instead, officials of the Village Companies suggested that two breakfast meetings be held so that presentations could be made to several potential contributors at once.

In addition to the obvious time savings of this approach, an even larger advantage to HSRC was that Village Companies officials know and regularly work with product promotion staff in the various community businesses -- people whom HSRC staff would not necessarily know. Thus, through the local media company key business leaders were quickly reached, through a friendly intermediary rather than walking in "cold." Lining up the 7,500 incentives proved to be a relatively easy task rather than the potentially difficult and time consuming effort anticipated. In a real sense the Village Companies became a joint sponsor of the effort.

Incentive Support

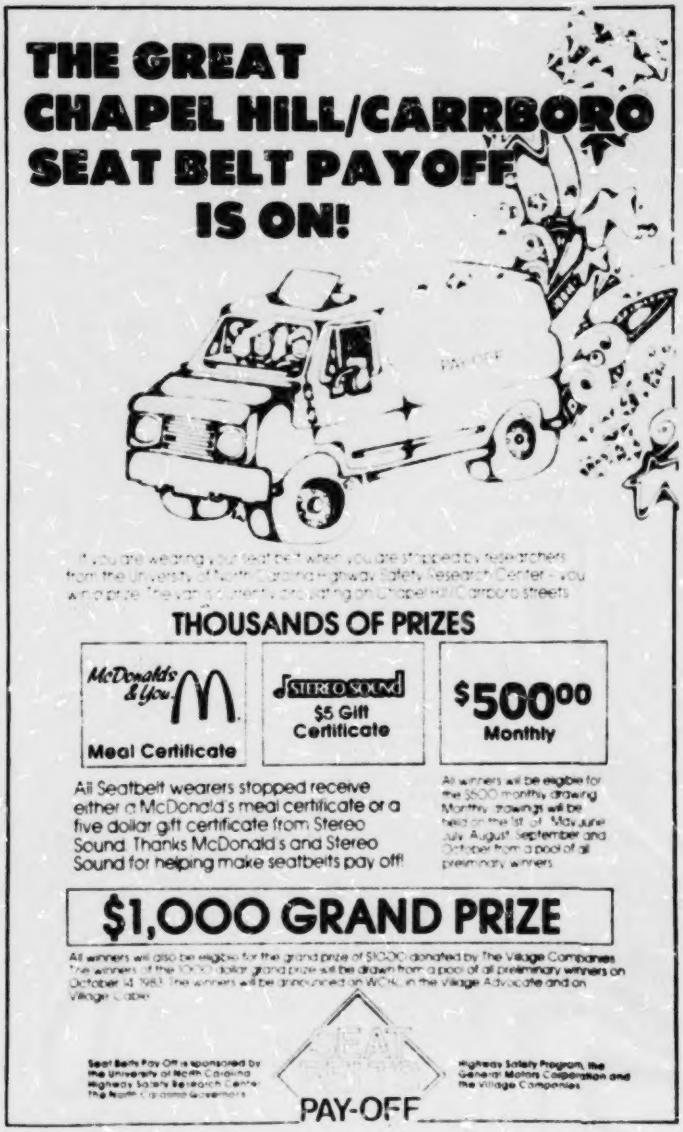
Through participation by several businesses, civic clubs and foundations, the following incentives became available for distribution to belt wearers:

3,600 free meals	McDonald's Corporation
1,200 six can containers	Coca-Cola Company
600 T-shirts	The Record Bar
100 $10.00 certificates	Ivey's Department Store
600 gift certificates	Woofer and Tweeter Stereo
600 gift certificates	Stereo Sound
80 $5.00 cash certificates	Northwestern Bank
300 packages of light bulbs	Duke Power Company
100 $5.00 certificates	Bailey's Dry Cleaners
20 $5.00 cash certificates	Carrboro Civic Club
20 $5.00 cash certificates	Chapel Hill/Carrboro Jaycees
20 $5.00 cash certificates	UNC Educational Foundation
120 free tickets	UNC Morehead Planetarium
100 free tickets	Village Companies Concert
Total = 7,460	

The estimated retail value of the incentives was $3 to $5 per incentive. At an average of $4 each, that would be a total prize value of about $30,000 contributed by the named businesses.

In addition, cash gifts in the amount of $4,000 were given by two campaign co-sponsors. The grand prize of $1,000 was given by the Village Companies, and the $3,000 in monthly $500 prizes was contributed by the General Motors Corporation. Thus, the total prize value for the entire campaign was about $34,000.

This number of incentives permitted awarding about 300 prizes per week for the entire 26 week project. Coupons were printed for each type of prize describing the gift, the expiration date, and also carrying the campaign slogan and/or logo. Even though extra prizes were awarded at the beginning of the incentive phase to spark interest, the approach of metering out the gifts at a fairly uniform rate was planned. Large contributors received free advertising (Figure 4.1) in the Village Advocate for a time period commensurate with the size of the donation (e.g., 600 prizes yielded advertising for an entire month). Scheduling of awards was made to coincide with the available advertising.



THE GREAT CHAPEL HILL/CARRBORO SEAT BELT PAYOFF IS ON!

If you are wearing your seat belt when you are stopped by researchers from the University of North Carolina Highway Safety Research Center – you win a prize. The van is currently circulating on Chapel Hill/Carrboro streets.

THOUSANDS OF PRIZES

McDonald's & You Meal Certificate

STEREO SOUND $5 Gift Certificate

$500.00 Monthly

All Seatbelt wearers stopped receive either a McDonald's meal certificate or a five dollar gift certificate from Stereo Sound. Thanks McDonald's and Stereo Sound for helping make seatbelts pay off!

All winners will be eligible for the $500 monthly drawing. Monthly drawings will be held on the 1st of May, June, July, August, September and October from a pool of all preliminary winners.

$1,000 GRAND PRIZE

All winners will also be eligible for the grand prize of $1000 donated by The Village Companies. The winners of the 1000 dollar grand prize will be drawn from a pool of all preliminary winners on October 14, 1983. The winners will be announced on WCHL, in the Village Advocate and on Village Cable.

SEAT BELTS PAY-OFF

Seat Belts Pay Off is sponsored by the University of North Carolina Highway Safety Research Center, the North Carolina Governor's Highway Safety Program, the General Motors Corporation and the Village Companies.

Figure 4.1. Sample Village Advocate advertisement.

Giving Out Incentives

1. Selecting Incentive Sites

Several factors were considered in deciding where to give out incentives:

a. It was vital that conditions at regular data sites not be influenced by the awarding of incentives nearby. Thus, incentives were never given out proximate to a site where data were then being recorded.

b. Incentive sites were varied so as not to reappear too often at any given place. Thus, incentives were distributed at literally scores of different sites around the community.

c. Most incentive sites were out-of-traffic such as at a shopping mall parking lot, gas station, etc. A spot was chosen to allow clear sight distance as vehicles pulled into the lot from the street or prepared to re-enter traffic. Thus, incentive givers could easily see and be seen (Figure 4.2).

d. Another necessary procedure was obtaining permission to give out incentives at private sites. Calls were made ahead of time to secure permission to appear at each place. This meant extensive telephoning, but permission was given almost without exception. In some cases, however, the proprietor requested that certain times be avoided because of crowded conditions. Up to a point, crowded conditions were a virtue, because of heightened visibility for the project. HSRC staff kept track of community events and tried to participate in various grand openings, special holiday events, other community events, etc. In these cases it was imperative to receive permission so as not to become an unwelcome addition.

e. A few incentive sites were actually in traffic on public streets. Use of local streets gave access to certain community areas where a business parking lot did not exist Streets were selected with relatively low volume or where traffic had to stop. Attempts were made to choose reasonably public places rather than secluded ones, so that drivers would not feel apprehensive about

FCX
FARM — HOME STORE
Carr
Mill

Figure 4.2. Sample of incentive award sites.

stopping. Good visibility was essential so that drivers could see the team well in advance. The police were notified that incentives would occasionally be awarded on neighborhood and public streets, and they had no objections, perhaps because they had viewed our procedure several times in the past. This phase was carried out without incident.

To meet all of the above site selection criteria, several HSRC teams drove all around the community and identified literally hundreds of potential sites. Some sites were visited only once, while others, such as large shopping malls, were targeted on multiple occasions. To give some idea of the coverage, at least 12 sites per week for 26 weeks were visited -- totalling more than 300 appearances.

2. Being Seen at the Incentive Sites

It was necessary to be highly visible and recognizable when incentives were given out. Where posible the project van was parked nearby. This yellow van was marked, front and back, with the campaign slogan, "Seat Belts Pay Off," and on each side was a large campaign logo incorporating the same phrase (Figure 4.3). In addition, on top of the van was a large sign with the words "Belt Use" and changeable placards showing belt use percent for the community that week.

The incentive team, normally two persons, usually wore yellow T-shirts or luminescent vests, and black hats, each bearing the campaign logo. All of this was designed not only to make the incentive crew visible for safety, but also, through recognition, to allay driver apprehensions about being invited to stop.

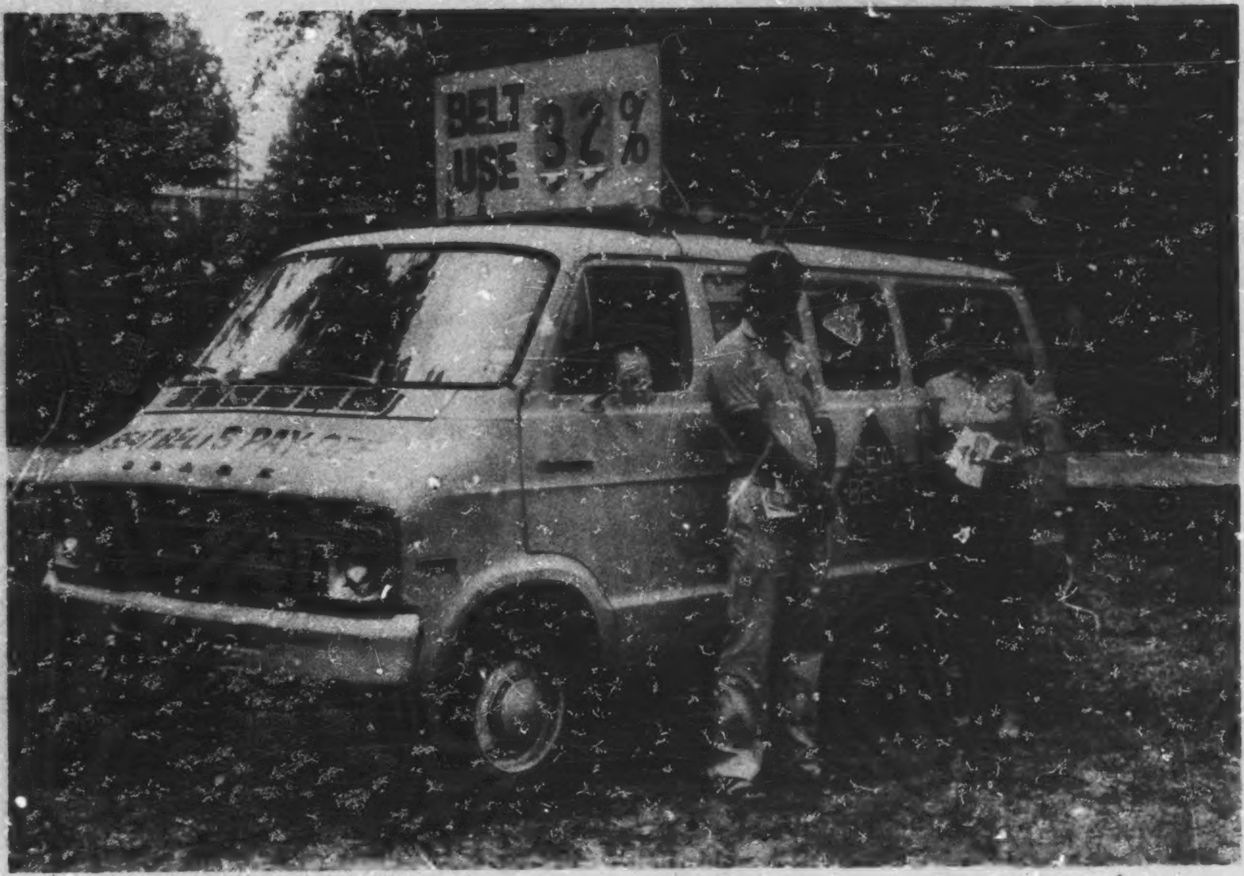


Figure 4.3. Members of the Seat Belts Pay Off team with van.

3. Deciding Who to Stop

In many cases volume was light enough that almost every car could be invited to stop. In this situation any car that could have belts was stopped, thus omitting only two-wheeled vehicles. Care was taken to avoid congestion problems. If three or four vehicles came in a row, the last one in the queue would be stopped to avoid delay to following motorists. While conducting a transaction with one vehicle, it would sometimes be necessary to wave others past, again to avoid congestion. If only two vehicles formed the queue, each incentive giver would handle a vehicle.

As can be seen from the above, the statement that cars were stopped "at random" is not quite correct. No table of random numbers was used to select the vehicles to be stopped. "At random" is largely correct, however, in the sense that it refers to vehicle arrivals at any incentive site. Because of the large number of prizes available (approximately 60 per day), coupled with a growing belt use rate, incentive givers often stopped every vehicle that passed the check point. This procedure was not possible, however, at sites with high traffic volume. What is meant by "at random" is that nothing was done deliberately to raise or lower the chances that any given individual would be stopped.

At locations with both high volume and high belt use, the requisite incentives could have been given out in a very few minutes. At such places it was important to "be seen" for a full 30-40 minutes, thus vehicles were stopped "at random". Sometimes this created a problem with regard to belted motorists who recognized that incentives were being awarded and who very clearly expected to be stopped.

4. The Incentive Transaction

Two team members, in place at the selected location, would hold up their hands to an approaching car, giving a signal to stop. They did not stand in the way, therefore allowing drivers to pass unimpeded if they wished. If the person stopped, one team member would approach the driver while the other watched for traffic.

While determining whether occupants were familiar with the campaign, the team member simultaneously handed the driver a brochure and checked to see who in the vehicle was belted. A prize and drawing card were awarded to each belted occupant, including children in child safety seats (or belts). The driver, and others if interested, then received a bumper sticker (Figure 4.4). Unrestrained occupants were given only a brochure and a friendly reminder to buckle up. They were thanked for stopping and waved on their way (having checked for traffic). The entire transaction took about 30 seconds -- longer if several in the car were buckled, or if questions were asked. In this process, HSRC staff were pleasant and lighthearted, because the transaction itself was to constitute a verbal reward for being buckled up.

For those not belted, the campaign was described, and the occupants were told what they would have won had they been buckled up. They were encouraged to use belts in the future since they would have other chances to win. Team members might also offer advice on how belts should be worn, or help an occupant untangle or adjust his or her belt.

Figure 4.4. Lucky Seat Belts Pay Off winners.

CHAPTER 5. PUBLIC EDUCATION EFFORTS

Public information and education activities occurred before and during the six-month period in which incentives were given out. The following section describes the many aspects of the effort to increase public understanding of the Seat Belts Pay Off campaign.

Media

1. Preliminary Efforts

Media coverage was critical to the continuous promotion of the campaign. Three weeks prior to initiation of the incentive phase, the preliminary education phase began. Messages of a public service nature were aired on a local cable television station, an AM radio station and in the bi-weekly advertising newspaper (the Village Advocate) to heighten community awareness about seat belts while withholding information on the incentive campaign to follow (Figure 5.1). The radio and cable television messages were recorded by a well known sports commentator associated with UNC athletics. Three themes were chosen:

1. If you buckle up your child, but not yourself, you're missing the point.
2. Don't be a drunk driver's victim, wear your seat belt.
3. Driving down Franklin Street (a local main street) at 25 mph you could be seriously injured or killed in a traffic accident.

Each message was written to address some locally pertinent issue. For example, local parents have done well in using child restraint devices for their children, yet many parents continue to ride unrestrained.

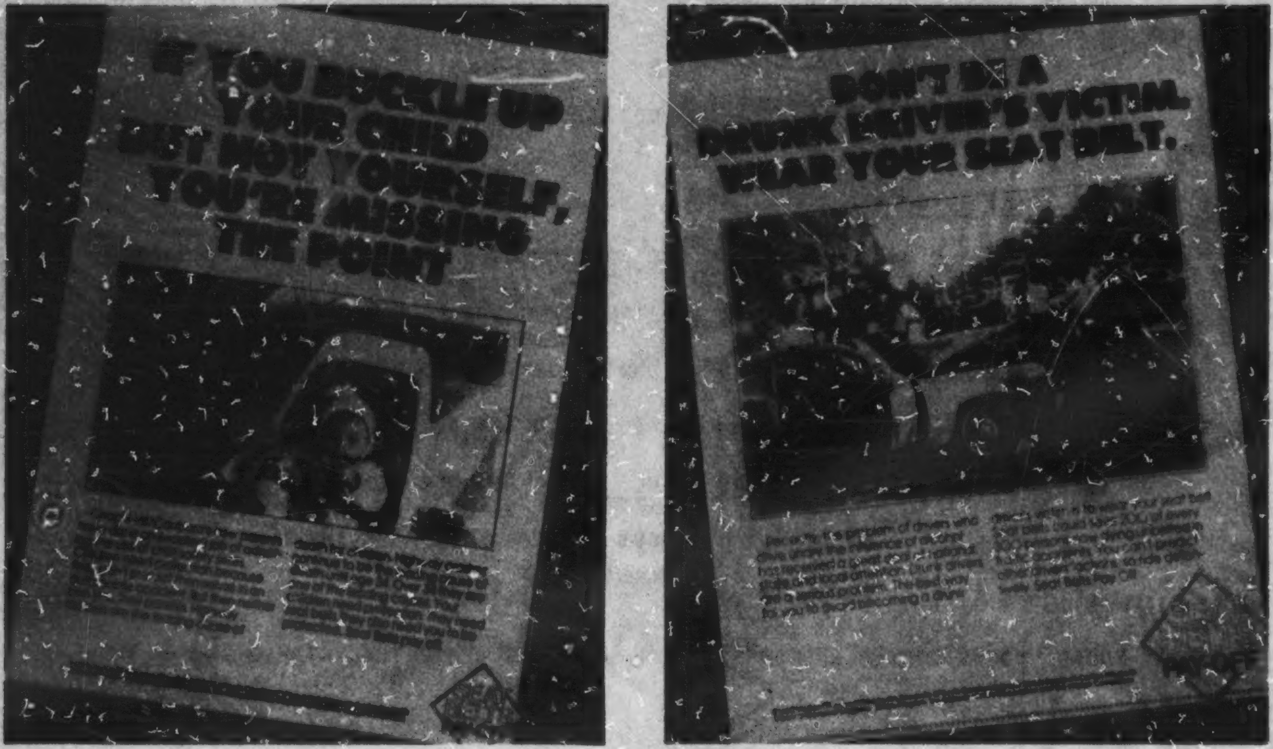

IF YOU BUCKLE UP YOUR CHILD BUT NOT YOURSELF, YOU'RE MISSING THE POINT
DON'T BE A DRUNK DRIVER'S VICTIM. WEAR YOUR SEAT BELT.
PAY OFF

Figure 5.1. Initial print media advertisements.

2. News

In addition to public service announcements, the campaign was also covered from a news standpoint. To help this along three news conferences were held during the six-month campaign. These are described in the highlights below.

A. The first, a luncheon on April 19, 1983, served as the campaign kick-off. Immediately afterwards, the first incentives were awarded at a large shopping mall with the media present. Media response was excellent and extensive news coverage occurred the next day. Full details of the "Seat Belts Pay Off" were announced to the public at this time.

B. On June 23rd, a second news conference was held to update the public after the first two months of the campaign. At this point the usage rate had reached 32 percent which tied the previously recorded high in Seattle, Washington based on a government survey (NHTSA, 1983). The challenge was made to Chapel Hill and Carrboro to "Beat Seattle."

More important, several persons were introduced who had experienced accidents, some serious, since the start of the campaign. All were wearing seat belts and all had been spared serious injury (possibly death in two cases). This was especially important in light of the fact that four other community residents had been killed recently in traffic accidents (none of whom were belted). Below is a summary of these crash "successes":

- One woman who attended the news conference had her accident shortly after a fatal crash in which an unbelted Chapel Hill man was ejected and killed. The woman, a University employee, was likewise in a rollover crash but was wearing a lap/shoulder belt. Her injuries were confined to a bump on the head, scratches, and a leg bruise.
- Also in that same rather short period, two other Chapel Hill residents were together in a very severe vehicle-to-vehicle crash. Their Volkswagen Rabbit was struck by a much heavier passenger car. The driver and the right front passenger were restrained using a three-point lap/shoulder system. Both suffered painful though not very severe injuries, as well as momentary unconsciousness. This was a crash of such severity that the belts may very well have saved their lives.
- A third crash involved a University employee driving back to Chapel Hill. She fell asleep, went off the road and struck a utility pole. Her injuries were trivial. This woman called HSRC to say that she had adopted the seat belt habit by virtue of the campaign -- it helped her change from an intermittent to a regular belt user.
- In a fourth case, a family of four was buckled up. Two lap belted sons in the rear seat sustained minor injuries. The father, driving, had leg bruises, but the right front seated mother suffered a fractured sternum and was hospitalized for a number of days. The fact that she fractured her sternum presumably by contact with the shoulder belt indicates the force with which her body was thrown forward. The father said their belted status was attributable to the local campaign.

Excellent media coverage was received in print, on radio and on television with particular attention to interviews with the several crash victims.

(3) The third surge of news coverage came on November 2, 1983, marking the conclusion of the six-month incentive phase of the campaign. At that time, major events were highlighted, campaign sponsors were recognized and the community was thanked for its participation. The cash prize winners as well as the accident victims were present to attest to the ways in which seat belts pay off.

(4) During the course of the campaign, news coverage was received in six newspapers, on approximately 15 area radio stations and on four television stations (one cable, three network). Coverage included news stories, editorials, interviews, educational messages and advertisements.

(5) One feature was the daily update on WCHL (AM) radio, the local Chapel Hill station. Each morning at 7:00 a.m., a project staff member had a two to three minute discussion/interview with the WCHL "morning man" about the previous day's events. The van's location, information on usage rates, educational facts about belts and any daily incentive anecdotes made up the conversation. This continued weekday mornings from June through October.

(6) News stories and interviews were aired on national radio as well as appearing in newspapers around the country on several occasions.

3. Additional Media Activities

A. UNC students represent about one-half of the population in the community and thus received special emphasis. The Daily Tar Heel, the student newspaper, published stories and advertisements about the campaign.

B. A series of twelve educational messages on seat belts was written and distributed to radio stations in the region. The messages were written to appeal to any audience, not merely those in Chapel Hill/Carrboro who would be affected by the campaign. (See Appendix A-1 for complete set.) For example:

> Women often ask the question, should I wear my seat belt if I am pregnant? The answer is YES, and here's why. By wearing your seat belt you are protecting your baby. The most serious risk to your unborn baby is that you will be injured. So buckle up for yourself and for your baby. Seat belts pay off.

Some sets of messages were mailed to station managers. In three cases, meetings were held and promotion directors agreed to air a certain number of spots. The contacts mentioned here were in addition to the extensive contribution from WCHL-AM, Chapel Hill.

C. Television interviews were also aired, as well as an hour radio call-in show from Raleigh, N.C. on WLLE-AM.

D. In addition to news coverage in local newspapers, editorials and letters to the editor appeared, and one Sunday column by a local celebrity was devoted to the seat belt issue.

E. The Chapel Hill Newspaper began daily reporting of the number of persons wearing seat belts in all accidents that occurred in town in their "Police Blotter" section.

F. As an interesting detail, an individual ran a personal ad in the Village Advocate. It appeared during the time that the prize was a transistor radio from a local stereo store.

> THANKS TO THE
>
> Seat Belts Pay Off people. I've gotten into the belt habit since your campaign started and Monday you rewarded me for my efforts. Someday your efforts may save my life, for the moment they've put some music into it. JWF.

G. In addition to the ongoing public information by radio and newspapers, other activities were undertaken to broaden the range of people reached. Early on, a brief write-up on the campaign was distributed to area churches for possible publication in their church bulletin or newsletter.

H. During the last few months of the campaign eleven large signs reading "Seat Belts Pay Off" were displayed on the backs of Coca-Cola trucks that serviced the Chapel Hill/Carrboro area (Figure 5.2). Trucks were parked in strategic positions during home football games during the fall to serve as reminders to buckle up on the way home from games.

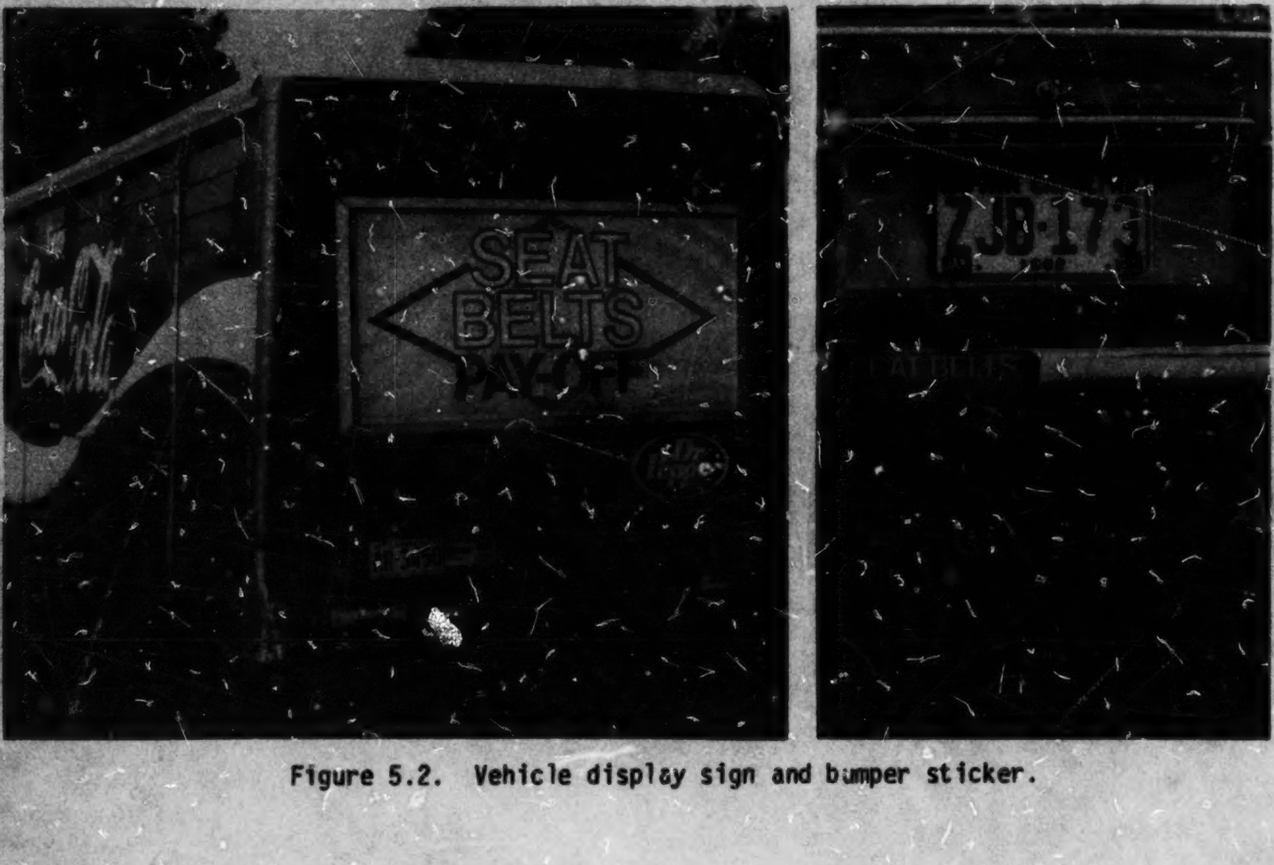


Figure 5.2. Vehicle display sign and bumper sticker.

Literature

A brochure and bumper sticker (Figure 5.2) were developed for distribution throughout the incentive phase. The brochure served a dual purpose. It described the "contest" rules, how to win, etc., and more importantly presented reasons for wearing seat belts (Appendix A-2). Two common myths (the fear of entrapment and the belief of the benefits of being "thrown clear" of the car) were addressed and clarified. Approximately 70,000 brochures and 15,000 bumper stickers (Appendix A-3) were distributed during the campaign.

Towards the middle of the six-month period, staff was faced with the fact that about half the people stopped (whether belted or not) still said they knew nothing of the campaign. When dealing with a community of 50,000 people, "getting the word out" is a difficult task. As a final effort to reach the whole community, a flier was prepared and mailed to all 19,000+ "resident" households in the two towns. The flier gave brief contest information and showed pictures of the first three $500 winners, local accident victims and their damaged cars, and the Seat Belts Pay Off van (Appendix A-4). At the same time a telephone line (962-BELT) was established (advertised on the flier) so that anyone wanting further information could call. The response to the phone line was quite limited (approximately 15 calls). Many other calls were made to the main HSRC number.

HSRC Involvement with the Community

HSRC also participated in a number of other contacts with the public designed to increase awareness of the campaign.

1. Presentations

A. HSRC staff made numerous presentations to local groups. Presentations typically consisted of a brief talk, showing a crash test film employing both belted and unbelted dummies, and discussion. Various civic clubs, recreation clubs and the school system requested or received presentations.

B. In several instances, presentations triggered others to make further presentations, thus expanding coverage greatly. For example, UNC dormitory residence hall advisors received presentations and packets of campaign material for subsequent meetings with dormitory students.

C. Brochures were handed out to UNC registrants during summer school and again in the fall. During the fall student registration process, HSRC staff spent two days handing out brochures to returning as well as new students. Students not familiar with the campaign were given a short explanation.

D. The Chapel Hill/Carrboro City Schools held Seat Belt Safety Week for the elementary schools in May. Presentations were made to the Safety Patrol groups in each of the six schools. These older students (5th and 6th grades) then made their own seat belt presentations to the younger students.

E. As an outgrowth of a local presentation, two 4-H groups produced a skit on drunk driving and seat belts which they performed for other 4-H members at a county-wide meeting.

F. Incentive awards were given at all elementary schools, the junior high schools, the high school and all Chapel Hill/Carrboro day care centers during the course of the six month incentive phase, coordinated with any school activities in this regard.

2. Belt Use Policies

In consideration of the campaign, the Chapel Hill Police Department enacted a belt use policy roughly coinciding with the beginning of the community wide incentive phase. We felt that police officers would serve as excellent role models for what we were trying to achieve in Chapel Hill/Carrboro. Initial use by police officers (as observed by HSRC data collectors) was very low, but their use rate was actually quite good by the end of the incentive phase.

Presentations about the need to wear seat belts were also made to Carrboro police, in the hope that they, too, would enact a corporate use policy. However, even though the chief of police advocated the use of seat belts, a mandatory policy was not formulated.

Following low belt use rates observed during an incentive session, the Orange Water and Sewer Authority (OWASA) requested presentations be made to employees. OWASA then adopted a mandatory belt use policy for employees on company business.

3. Celebrities

For the purpose of adding new faces to the incentive process, three local celebrities helped award incentives at different times. Mayor Robert Drakeford of Carrboro helped in a Carrboro shopping center while Mayor Joseph Nassif of Chapel Hill greeted people in a Chapel Hill Municipal Parking Lot along with project staff. Ron Stutts, the WCHL-AM radio "morning man," accompanied the team to a Chapel Hill shopping mall and interviewed "winners" and "losers." He was able to record stories which were then aired frequently over the following few days. (While he was out with the HSRC team a car was stopped in which there were seven winners, a woman and six children. Besides establishing the local "record" for winners in one vehicle, this made for an interesting tape.

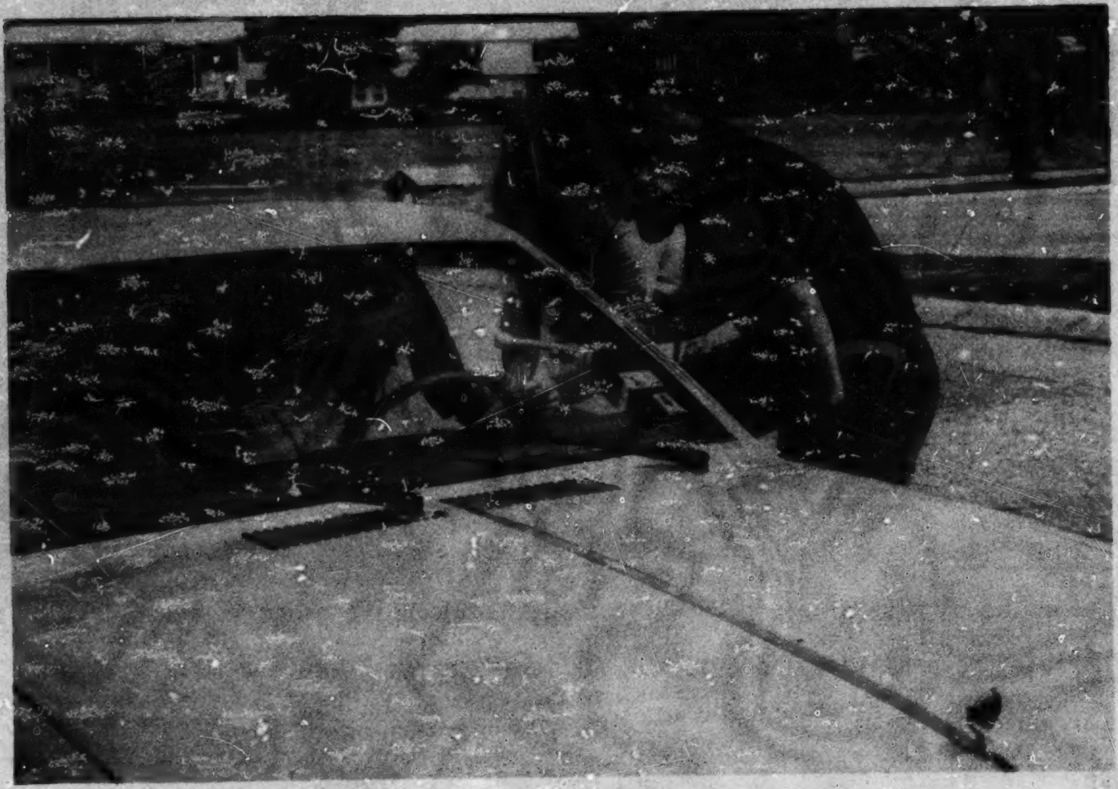


Figure 5.3. WCHL "Morning Man" interviewing winners.

4. Presence at Community Events

An effort was made to display the Seat Belts Pay Off van at major community events, with staff awarding prizes or distributing information. For example, staff and the van were present at the spring and fall street fairs, N.C. Dairy Day in June, the Big Deal on Wheels (a safety day sponsored by a junior high school) and the Fourth of July celebration in both towns. 4-H club members helped distribute brochures and discussed the campaign with townspeople during the spring street fair.

5. Cash Drawings

As stated, everyone awarded an incentive received a postage paid, pre-addressed postcard which, if filled out and returned to HSRC, would make them eligible for a $500 and $1,000 cash drawing (Appendix A-5). On the first of each month (May-October), a name was drawn from the cards received the previous month. The winner received a check for $500. These drawings were planned to stimulate and maintain interest in the campaign and provide extra incentive for buckling up.

Each drawing received good coverage from the media. Newspapers from Chapel Hill, Durham and Raleigh ran stories about each winner, and the Chapel Hill Newspaper and the Village Advocate generally utilized photographs as well. In addition, WCHL conducted "live" telephone interviews with the surprised winners. Tapes of these interviews were then aired frequently for the next few days. The WCHL morning updates also focused on the "stories" of each winner. A brief biographical sketch of each of the cash winners is provided as Appendix A-6.

Everyone who had mailed in a postcard at any time during the campaign was then eligible for the $1,000 grand prize to be awarded on November 2, 1983. The final winner's name was drawn from among the 6003 cards mailed in. Since 7460 cards were given out this is a gratifying 80 percent return rate.

Community Response

During the entire campaign, elements of community response were noted. Most obvious was how people responded when stopped during the incentive phase. For the most part both "winners" and "losers" were pleasant, excited, etc. Some of the prizes (soft drinks and a few transistor radios) were given directly to the winners, but for the most part coupons were utilized. The coupon required the winner to pick up the prize at the sponsoring agency (Appendix A-7). Winners never seemed to mind this inconvenience, and an informal post-incentive survey of sponsors revealed that the vast majority of the coupons were brought in for exchange.

While driving around town in the van, the driver was frequently greeted by waves, tugging on belts, smiles, honking, etc. It was not uncommon to see someone attempting to buckle up as they drove or when stopped for a red light. Some of this was perhaps spurred by the belief that one could win by being pulled over in traffic. Others perhaps saw the van as a reminder to buckle up. Children were especially appealing as they craned their necks, staring at the van in hopes of being stopped.

Some citizens took it upon themselves to "spread the word." One woman said she had posted the brochure on her church bulletin board. Bumper stickers showed up posted on walls in restaurants, at the faculty recreation club, etc. A man who was stopped at the Carrboro Post Office took his brochure and pinned it up on the wall inside.

A woman telephoned to acknowledge that she had won a container of sodas. She noticed a man with his belt on so she gave him three sodas from her container.

These anecdotes illustrate the generally positive community reaction that continued throughout the campaign.

CHAPTER 6. EVALUATION DESIGN

Introduction

This effort was a research project as well as a promotional campaign; therefore, it was necessary to document the degree of success in changing belt use. An evaluation was planned to develop answers about the effectiveness of this effort.

Phases

This project was planned as a multi-year effort consisting of four phases. Belt use data were collected during all four phases.

1. Baseline - Beginning the first week in February, 1983, belt use data were collected for eight weeks before townspeople knew of the project to follow.

2. Education/Promotion - Immediately following the baseline, emphasis of the three major themes[1] began. This phase lasted for three weeks, with each theme being emphasized one week. The themes were presented on radio and cable television spots, and full page ads appeared twice a week in the *Village Advocate*. These concerned belt information only -- nothing about the incentive aspects. Other activities were also a part of this phase, including presentations to civic clubs and other groups, contacts with the University and business communities, contacts with newspapers and radio and television stations, etc.

3. Incentive - The incentive phase began on April 19, 1983. Following a press luncheon, the first incentives were given out in the midst of active press coverage at Chapel Hill's largest shopping mall. In general, incentives were awarded twice a day on weekdays and twice on weekends until October 17, 1983. During this six-month effort, well over 300 trips were made to award incentives. Major public education efforts continued during this phase.

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[1] As mentioned earlier, the themes were:

1. If you buckle up your child, but not yourself, you're missing the point.
2. Don't be a drunk driver's victim, wear your seat belt.
3. Driving down Franklin Street (a local main street) at 25 mph you could be seriously injured or killed in a traffic accident.

4. Follow-up - The follow-up phase began October 18, 1983, and will continue for at least one year. During the first six or so months of follow-up, no incentives will be awarded, with sharply limited public education. The intent is to ascertain the persistence of any belt-wearing effect. There is a possibility that incentives will be reinstituted in the future, although the decision will be tailored to the observed use rate at the time.[1]

The main dependent variable throughout the effort has been driver shoulder belt use in the population of passenger cars equipped with shoulder belts (i.e., non-convertibles of recent enough vintage to have a head restraint). Trucks, vans, utility vehicles and other "special" vehicles are omitted from the data because shoulder belts are not always available. Inclusion of these vehicles would result in consistency problems. (All vehicles, however, were eligible for prizes during the incentive phase.) In addition to observations in the population at large, belt use in accidents was analyzed for several years before the campaign and during the six-month incentive effort.

Data Site Selection

Preliminary observations revealed that seat belt wearing rates varied considerably from location to location throughout the Chapel Hill/Carrboro community. The rates also varied with time of day with, for example, rush hour commuting drivers having generally higher usage rates than drivers in many off-peak situations. This variation made it necessary to collect data at many different locations and at several different times of day in order to obtain reasonable estimates of the communitywide seat belt usage rates.

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[1] A follow-up Governor's Highway Safety Program (GHSP) grant will allow further evaluation of this project. One component includes the development and implementation of a survey instrument to elicit opinion from community residents about the conduct of this project. In addition, if belt use rates decrease toward the baseline rate, another task permits use of incentives for a short time (possibly one month) to test the effect of a re-intervention.

After visiting many potential locations, 17 were selected as permanent observation sites. The sites had to be such that staff could park or stand near enough to the road to observe, and the traffic speed had to be slow enough to permit reasonable viewing before the car rushed by (Figure 6.1). In terms of traffic, the intent was to include: (1) essentially every major commuting route into the community, (2) central downtown and campus areas, (3) major cross town routes, and (4) some residential areas. Also it was important to avoid through routes that might include an undue proportion of drivers from outside the community -- those who would have no reason to know about the belt promotion effort.

Figure 6.1. HSRC staff person collecting data from van.

To avoid short-term influence on data at these sites we did not allow incentives to be given out nearby when data were being collected. This was easily accccomplished since the data sites were relatively major traffic ways in many cases, whereas the incentive sites were mostly out-of-traffic private property sites. Whereas there were over 300 incentive sites, many visited only once, the same 17 data sites were monitored throughout.

Sampling Plan

During the baseline period, observations were made at most sites during five time periods -- morning peak and off-peak times, afternoon peak and off-peak times, and on weekends. From these baseline observations, seat belt rates were computed for each available site x time period combination (85 in all). These rates were then ranked in order of increasing belt usage, and the many site x time combinations were divided into seven groups such that seat belt use rates were fairly homogeneous within a group, but varied considerably from group to group. The number (seven) of groups was, in part, a result of natural breaks in the observed use rates, and also the need to have a manageable number so that a site from each group could be sampled each week.

The idea was that this collection of rates by location and time period represented the distribution of different belt usage rates that existed in the community. This distribution could be sampled by visiting one site (at a specified time) from each of the seven groups each week.

The groups contained varying numbers of site x time combinations which, in turn, represented a wide range of traffic volumes. Thus, for each of the seven groups a weight was determined which was the proportion of the total traffic volume accounted for by sites in that group, where the total traffic volume was taken as the sum of the volumes over all site x time combinations. An overall weekly belt use rate was then computed using the formula

$$R_t = \sum_{i=1}^{7} w_i r_{it} ,$$

where w_i is the weight for the ith group of sites, and r_{it} is the observed belt usage rate for the site selected from the ith group for week t.

The number of site x time combinations in a group varied from five to fourteen. Each week one site was selected from each group for observation. A systematic procedure was used for selecting sites so that over the course of the study all the sites within a group were visited with approximately equal frequencies. Moreover, in each weekly sample we attempted to maintain a balance among morning, afternoon, and weekend observations, peak and off-peak time periods, and to balance a site with a relatively high baseline rate from one group with a site with a relatively low baseline rate from another.

During the course of the study there were a few occasions when an observation for some group was missed for a given week. In view of the inherent differences in rates between groups and the evolutionary nature of the rates during the incentive phase, it seemed that the best estimate of the weekly rate could, in this case, be made by substituting data for the previous week for the missing observation in that group.

The sampling scheme described above was designed to yield estimates of communitywide driver seat belt usage rates on a weekly basis. It was not designed to provide the most representative estimates of usage rates for various subpopulations (e.g., black drivers, female drivers, weekend drivers, etc.). It is, however, of interest to estimate and compare usage rates among certain of these subpopulations. The rate estimates that were computed for the various subpopulations were again weighted averages of the observed rates, but in this case the weights were based strictly on the traffic volumes of the observed sites, not the overall group weights. For example, suppose r_{1t}, r_{2t}, ...r_{7t} are the belt use rates for male drivers calculated from observations made at the seven sites visited during week t. Suppose, moreover, that m_{1t}, m_{2t}, ..., m_{7t} are the total numbers (or volumes) of male drivers observed at the same sites. Then an overall male belt use rate for week t is calculated as

$$R_{m,t} = w_{1t}r_{1t} + w_{2t}r_{2t} + \dots + w_{7t}r_{7t} \quad ,$$

$$\text{where} \quad w_{it} = \frac{m_{it}}{\sum_{i=1}^{7} m_{it}} \quad , \quad i = 1, 2, \dots, 7 \quad .$$

It should be noted that the weights in this formula are functions only of the traffic volumes observed at the sites visited during week t, rather than those determined for the entire groups of sites as was the case in the earlier formula for R_t.

The Actual Observations

As mentioned earlier, visits were made to seven sites each week to gather belt use data representative of the community for that week. For the most practical reason of ability to see, belt observations were confined to daytime hours. During the summer there was no particular difficulty in observing, except for occasional periods of heavy rain or fog. However, in winter comes the return to standard time, and by late November local sunset in Chapel Hill ruled out evening rush hour observations. Adjustments were made to the sampling plan to account for the absence of these end of day observations.

Three variables were recorded for each eligible vehicle: driver belt use (yes, no), driver race (black, non-black) and driver sex (male, female). Eligible vehicles included all passenger cars equipped with head restraints. As head restraints became mandatory safety equipment at the same time as shoulder belt systems, this assured that the cars observed had been equipped with shoulder belts. Exceptions were the convertible model cars, so that these were excluded from the observations.

Note that in coding race, the actual on-site procedure was to code black and non-black. Thus Asians, Native Americans, Middle Easterners etc., were grouped in the white group. The age variable was also of interest, but could not be estimated accurately enough to warrant inclusion.

Finally, observers were instructed that the shoulder belt had to be positioned correctly to count as a positive response. For example, some people, presumably bothered by the shoulder belt rubbing against their neck, place the shoulder belt under their arm. Observers were instructed to count this as unbelted.

At each site, observers would spend approximately 30 minutes recording data for each direction of traffic (e.g., eastbound - westbound). If the observer spent less than 30 minutes for a particular direction, software would adjust the counts up to what would have been expected for 30 minutes. In other words, if 100 passenger cars were observed in a 24-minute period, then the adjusted total for that site and direction would be

$$\frac{30}{24} \times 100 = 125 \text{ cars}$$

A similar procedure was used to discount observations if the observer exceeded the 30-minute period. The adjusted totals thus consistently represented 30 minute samples for each direction.

Traffic volume was a problem in some of the site x time combinations, in that volume was so heavy not all vehicles could be counted. In some situations, only a few vehicles were missed, or the complete belt-sex-race entry could not be obtained. These were simply entered as "unknowns." The "unknowns" were then added to the data set so as to produce the same overall use rate. For example, suppose the shoulder belt use rate for 147 "good" observations was 19.7 percent (i.e., 29 shoulder belt wearers). If there were six "unknowns" to be added (new total of 153), this would produce an equivalent adjusted rate of

$$\frac{30.1 \text{ shoulder belt users}}{153 \text{ drivers}} = 19.7\% \text{ rate}$$

The six "unknowns" would then be distributed within the race-sex categories in the same fashion (i.e., a numerator/denominator adjustment that yields the same observed rate).

In other instances, such as peak-hour observations, traffic would be so heavy that many vehicles would be missed. In this case, data collectors would begin and end each 30 minute data collection period with a five-minute volume count. These values would be entered on the standard data form. Upon processing, software would calculate the mean five-minute volume count and multiply this value by six to produce the expected 30 minute volume count. For example, suppose an observer were able to get complete data on 400 cars during the 30-minute period, but the expected 30-minute volume produced by five-minute counts was 468 cars. The extra 68 vehicles would then be added to the data set, using adjustments similar to those mentioned above to distribute the vehicles in the proper race-sex proportions. The standard data reporting form is shown as Figure 6.2.

Reliability of Seat Belt Observations

The success of the evaluation phase of this project hinges on the ability of observers sitting in a parked car to determine reliably whether belts are being worn in passing cars, and also to determine the sex and race of the drivers. In order to evaluate this observing ability, the following study of inter-rater reliability was conducted.

SEAT BELT DATA COLLECTION
FORM

Header Information

(Complete each time data are collected)

Site	Direction	Observer	Phase	Date	Day	Start Time	End Time	Weather	Start Volume	End Volume	No. Unknowns
_ _	_	_ _ _	_	_ _ _ _ _ _	_	_ _ _ _	_ _ _ _	_	_ _ _	_ _ _	_ _

CODES:

Direction

N
E
S
W
B = both directions

Phase

A = Baseline
B = Education/Promotion
C = Incentive
D = Follow-up

Day

1 = Monday
2 = Tuesday
3 = Wednesday
4 = Thursday
5 = Friday
6 = Saturday
7 = Sunday

Weather

1 = Clear (Sunny)
2 = Cloudy
3 = Raining
4 = Snowing
5 = Fog
6 = Sleet or Hail
7 = Clear/Cloudy but adverse surface condition

General:

Use military time (e.g. 7:00 a.m. = 0700
2:30 p.m. = 1430)

Volume and Unknown Counts:

Enter 5 minute volume counts if necessary. If volume counts are entered, enter "0" for "No. Unknowns." If unknowns are counted and entered, enter "000 000" for "Begin Volume" and "End Volume."

Tallies

	White Male	White Female	Black Male	Black Female	Total
Fraction	☐	☐	☐	☐	☐
Percent	%	%	%	%	%

Comments (Unusual events, conditions, etc.)

Figure 6.2. Standard data reporting form.

Seven HSRC observers went to one of the regular sites. The observers parked side-by-side in six separate cars. The seven observers made simultaneous independent observations of 98 passing vehicles. Originally the intention was to cover 100 vehicles, but two had to be discarded because of difficulties in recording and in communication among the several vehicles.

Upon a pre-determined signal (a beep of the horn), the counting began and 98 vehicles were observed and classified appropriately. Vehicles were discarded and not classified if they were vans, pick-up trucks or utility vehicles, as stated earlier. The observations were done independently without any conversation or checking among the seven observers. Among the 98 cases classified, the following resulted:

66 cases of agreement regarding belt, sex, race by all seven observers

20 cases of agreement by all seven observers that the vehicles should be discarded

12 cases of some disagreement

98 cases

In 86 of the 98 cases there was complete agreement among all seven observers, and in 12 cases there was not perfect agreement. The 12 cases break down as follows:

6 cases of disagreement with respect to driver sex but complete agreement with respect to driver race and belt status.

3 cases of disagreement with respect to inclusion of the vehicle but with complete agreement otherwise.

3 cases of disagreement with respect to belt status, but complete agreement with respect to sex and race.

Details are set forth below.

First, consider the 6 cases in which the observers disagreed with respect to driver sex. Those 6 cases break down this way:

4 cases of 6 agree and 1 dissent

1 case of 5 agree and 2 dissent

1 case of 4 agree and 3 dissent

Second, in three of the 12 cases, the disagreement concerned whether to include the car. In 2 cases, 6 observers included the car, but one observer discarded the case (no head restraint). In the other case, 4 observers included the car but the other three discarded it for the same reason.

Third, there were three cases in which the disagreement concerned belts. In all three of those cases, 6 observers classified the driver belted. The remaining observer reported no belt use.

Thus, among the 12 cases in which there was not complete agreement, the disagreement pertained to only one classified dimension. Summing up, the degree of discrepany is distributed as follows:

In 88 cases the "split" was 7 judges vs 0.
In 9 cases, the split was 6 vs 1 (that is, 9 dissents -- 9 x 1).
In 1 case, the split was 5 vs 2 (that is, 2 dissents -- 1 x 2).
In 2 cases, the split was 4 vs 3 (that is, 6 dissents -- 2 x 3).
Total 17 dissents

In all, a total of 2058 judgments were made (98 cases x 7 observers x 3 dimensions (belt, sex, race)). The 17 instances of a dissenting view among the 2058 observations produce an error rate of about 0.8 of one percent. The largest portion of the discrepancies were with respect to driver sex, and this indeed is a difficult judgment, given today's hair styles, clothing, etc. As to the most important variable, belt status, only 3 times out of 686 was there disagreement. This yields an error rate of about 0.4 of one percent.

In summary, observers demonstrated ability to make the required observations. The reliability among judges was sufficiently high to be able to detect significant changes in belt use levels induced by the project, and also to detect differences in wearing rates related to sex or race.

Lap Belt Add-On Factor

Shoulder belt use was typically observed from the Seat Belts Pay Off van parked alongside the road. Form this position it was not usually possible to note the use of the lap belt only. However, it was necessary to estimate "lap belt only" as well as lap/shoulder use. A special set of data was therefore collected to allow an estimate of the number of additional drivers who were lap belt restrained beyond those with shoulder belts.

In mid-August, 1983, HSRC staff began data collection to determine the lap belt add-on factor for the Chapel Hill/Carrboro community. This was during the fifth month of the six month incentive campaign. The procedure involved visiting as many of the 17 permanent data collection sites as would permit the observer to be close enough to the cars to obtain lap belt status. At some sites this necessitated, for example, a shift of the observation point from mid-block point to an intersection. One site was not covered because of the lack of an acceptable vantage point. Data collectors were asked to determine driver belt status (lap, lap and shoulder, improper use of lap and shoulder, unknown, none) by race and sex for a minimum of 100 eligible passenger cars.

The lap belt add-on factor was then calculated. The total number of observations of eligible vehicles, N, was first classified into N_s cases where the drivers were wearing shoulder belts correctly and N_{ns} cases where they were not. This second group was further subclassified into three groups:

1. Those who were unrestrained, N_0,
2. Those wearing the lap belt only or the shoulder belt incorrectly (i.e., under their arm), N_1.
3. A group of unknowns where it was not possible to determine with certainty whether or not the lap belt was being worn, N_u.

Thus, $N_{ns} = N_o + N_l + N_u$. A flow chart of this breakdown is given in Figure 6.3.

An unbiased estimate of the proportion of drivers who are lap belted but not shoulder belted is obtained by

$$p_l = \frac{N_l}{N_l + N_o},$$

and an estimate of the total number of drivers (out of N) who are lap belted but not shoulder belted is given by

$$\hat{N}_l = p_l N_{ns}.$$

Finally, the ratio of lap belted (only) drivers to shoulder belted drivers is given by

$$f = \frac{p_l N_{ns}}{N_s}.$$

This factor can then be used to "adjust" or inflate the observed proportions of shoulder belted drivers to account for the lap (only) belted drivers who cannot be observed by our routine observations. Thus, if P_s is an observed proportion of shoulder belted drivers, then

$$P_s^* = (1 + f) P_s$$

is the inflated belt wearing rate which reflects the unobserved lap (only) belted drivers.

In the fashion described above, data were collected from 16 sites near the end of August (Table 6.1). Analysis of the data yielded a lap belt add-on factor of 11 percent (or a multiplier of 1+f = 1.11). In other words, a shoulder belt use rate of 30 percent would translate into a total restraint use

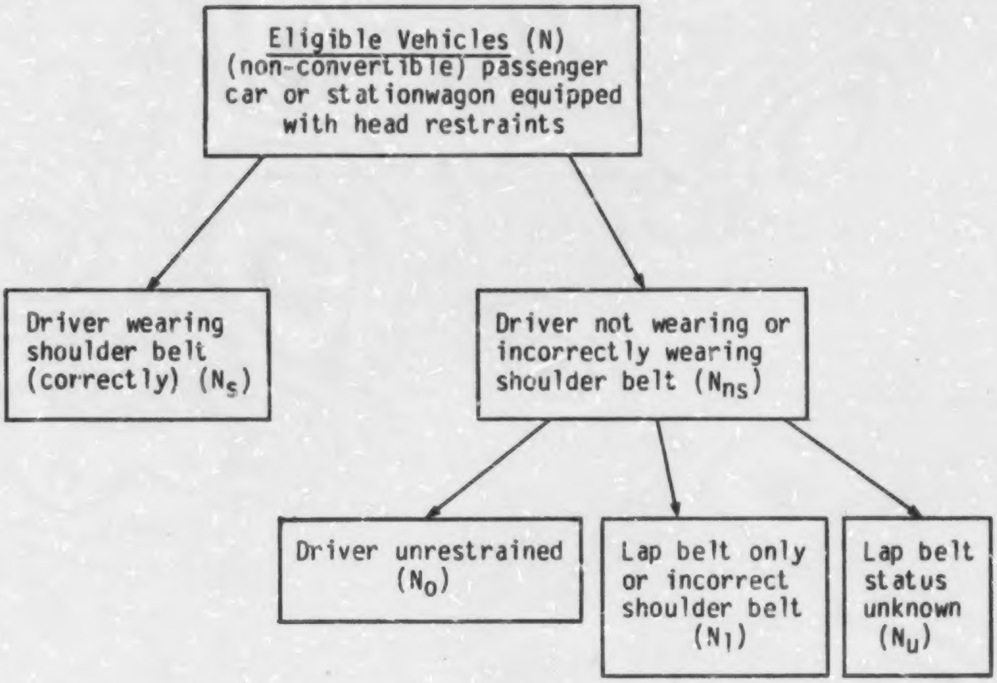
Eligible Vehicles (N)
(non-convertible) passenger car or stationwagon equipped with head restraints
Driver wearing shoulder belt (correctly) (N_s)
Driver not wearing or incorrectly wearing shoulder belt (N_{ns})
Driver unrestrained (N_0)
Lap belt only or incorrect shoulder belt (N_1)
Lap belt status unknown (N_u)

Figure 6.3. Flow chart for driver classification.

Table 6.1. Observations of lap belt use in addition to lap/shoulder use.

	White Male	White Female	Black Male	Black Female	Total
Unbelted	483	491	98	80	1152
Lap/Shoulder	223	336	11	20	590
Improper Shoulder*	6	10	4	0	20
Lap Only	15	23	3	2	43
Unable to Determine	14	53	5	4	86
Total	751	913	121	106	1891

*Shoulder belt worn under arm, on wrong side of body etc. with lap belt being properly worn.

of 33.3 percent (30 percent x 1.11). There were little differences by race and sex.

Once the lap belt add-on factor was determined, this percentage was included in the community wide belt use rate displayed on the sign atop the yellow van and otherwise publicized. Thus the assumption is that use rates of lap belt only changed in harmony with lap/shoulder belt use.

CHAPTER 7. RESULTS

Analysis of Community Seat Belt Use Rates

Weekly data collected during the incentive phase showed an upward trend even in the presence of week-to-week variation (Figure 7.1). From a baseline use rate of 24 percent (including the "add-on" for lap belts), belt use grew steadily throughout the incentive phase and peaked at 41 percent during the last week of the campaign. This means that for every 100 belt wearers in the baseline period, there were 171 wearers at the peak (41/24 x 100 = 171 -- a 71% increase in belt use) (Figure 7.2). That change is, of course, highly statistically significant. As would be expected, a decrease has become evident during the initial weeks of the follow-up period. Follow-up data will be collected for approximately one year to examine the full nature of the decline and any stabilizing that occurs. So far (two months past the end of the incentive phase), weekly belt use rates have declined to an average of 36 percent.

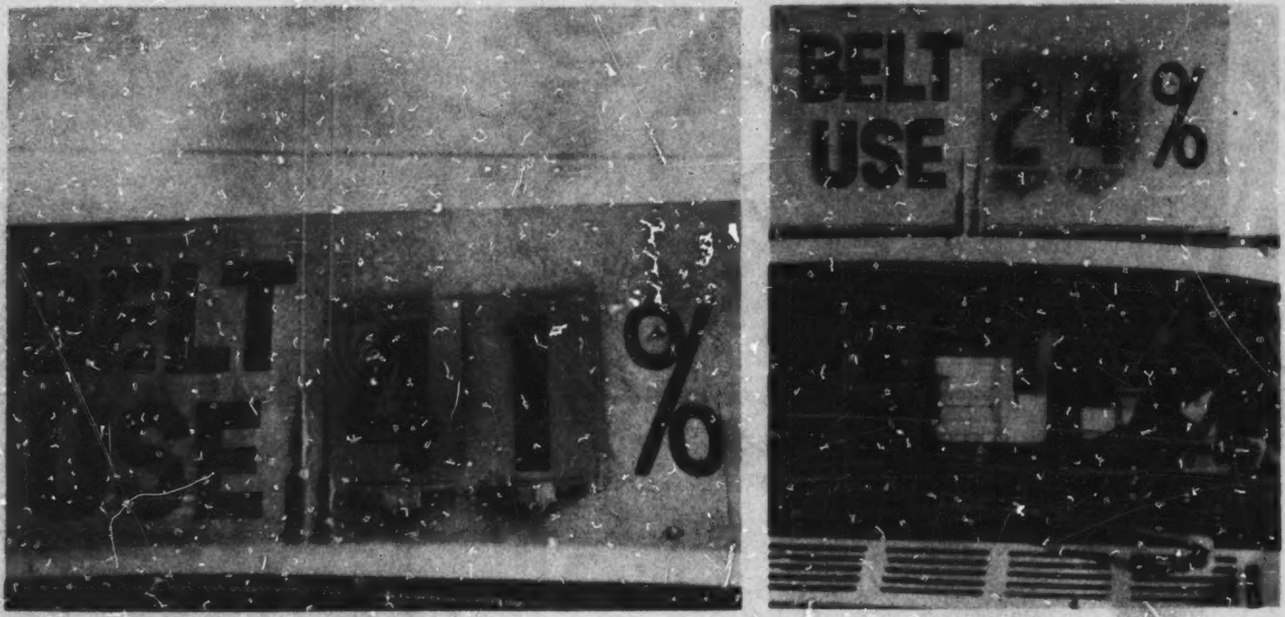

Figure 7.2. Van displaying current belt use rates.

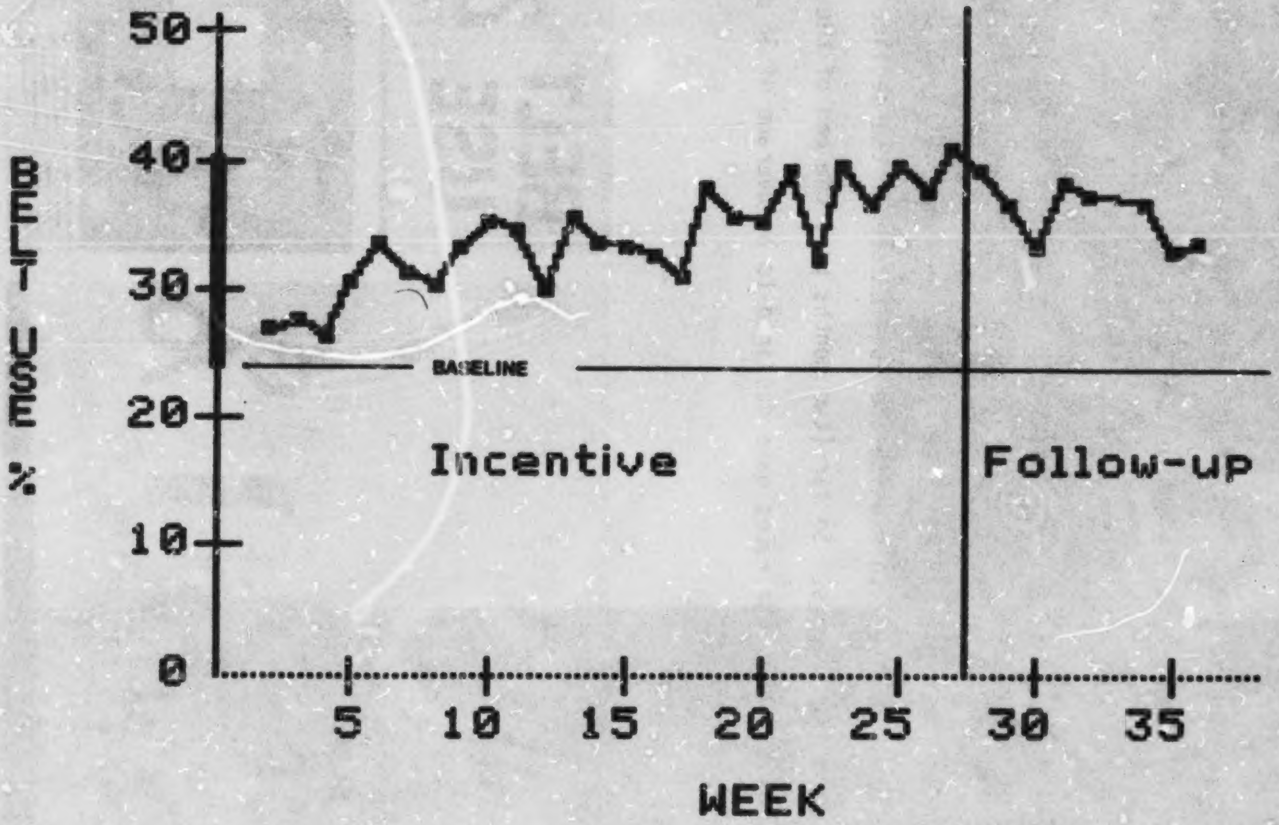

Figure 7.1. Community seat belt use by week.

As described earlier, the constituency of the local population shifted during the incentive phase. The full UNC student body was involved in the first five weeks of this phase, but then the spring semester ended and most students left the community. A greatly reduced number of students (down from 21,000 to 6,000) attended two summer school sessions. Summer was also marked by a large number of transient people in the community, as a variety of summer institutes were held at UNC. Regular students returned during the last six to eight weeks of the incentive phase.

The question then arose as to whether the trend in Figure 7.1 reflected a real increase in the community seat belt use rates or could be due simply to chance fluctuations in our observations. Estimates of the standard errors of the overall weekly rates were computed as functions of the variances of the observed rates by site and time, the group weights and the lap belt add-on factor. For a typical week an estimate of the standard error was computed to be 1.4 percentage points. With standard errors of this magnitude a rate difference of about four percentage points would represent a statistically significant growth assuming the rates to be independent. (Since some of the same drivers may be observed in different samples the assumption of independence does not strictly hold.)

Of more interest than weekly comparisons was characterization of overall changes in use rates over the entire incentive phase and into the follow-up phase. To this end several regression models were fitted to the weekly community use rates in order to characterize trends in the data and to test their significance.

The data to which these models were fitted consisted of a single point representing the baseline use rate,[1] the twenty-six weekly rates corresponding to the incentive phase, and the first eight weekly rates of the follow-up phase. The data points show a general increase from baseline through the incentive phase, with a modest drop-off at the beginning of the follow-up phase.

Figure 7.3 shows a model containing one linear trend fitted to the data points from the incentive phase and the single baseline point, and a second linear trend fitted to the follow-up data. The slope of the trend line fitted to the baseline/incentive data is positive (showing an increase of about one half a percentage point per week) and highly significant (p = .0001). It is interesting to note that there is no particular indication of a leveling off of the growth during the incentive phase. The trend fitted to the follow-up data has a negative or decreasing slope, but the slope is not statistically significant (p = .32).

A second model which also fits well to the available data (Figure 7.3) contains the same increasing linear trend throughout the incentive phase but predicts a constant level for the follow-up points. That is not to suggest that we believe there will be no dropoff. As more follow-up data are collected in months to come, the post-incentive trend will become clearer.

From these models it can be concluded that the community wide seat belt use rates increased significantly over the incentive phase of the project. Since the end of the incentive phase, the use rate has dropped to a level about three percentage points below the trend line at the end of the incentive phase. The follow-up level is currently, however, some nine percentage points (a statistically significant amount) higher than the initial level of the trend

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[1] The point represents data collected over the first 11 weeks of the project.

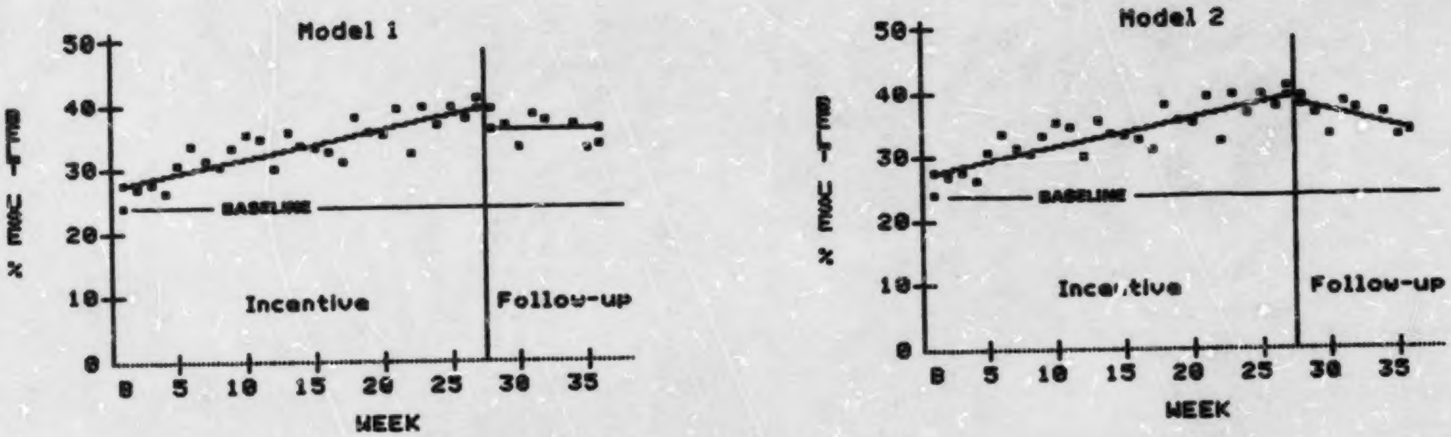

Figure 7.3. Models fitted to the weekly seat belt data.

line. The initial level of the trend line also exceeded the actual baseline observation point.

Comparisons by Driver Sex

Shoulder belt use by driver sex is plotted in Figure 7.4. Belt use for females was higher than that for males in all but two weeks of the incentive phase. The plots for each sex are relatively parallel, and each showed growth in the use rate over time. The peak values for both males (≈ 40 percent) and females (≈ 46 percent) occurred near the end of the incentive phase. In fact, these plots are very similar to the overall plot shown in Figure 7.1. The female rate was about two to four percentage points higher during most of the weeks.

During baseline, the female use rate was about 2.5 percentage points higher (25.3 versus 22.6 percent). Interestingly, the female use rate then increased some five percentage points between baseline and the first incentive week, while the male rate increased only two percentage points. The largest differential (seven percentage points) occurred during the last week of the incentive phase. It is not known whether these initial and ending differences represent only site-to-site variation or perhaps a heightened contest awareness by female drivers.

Comparisons by Race

The clear-cut weekly differences in belt use between white (i.e., non-black) and black drivers are shown in Figure 7.5. During the baseline phase, the overall white use rate was 4.4 times the black use rate (27.5 versus 6.2 percent). For most of the weeks of the incentive and follow-up phases, the white use rate was about 3.5 times the black use rate. The white use rate peaked at 47 percent during the last week of the incentive phase, while the

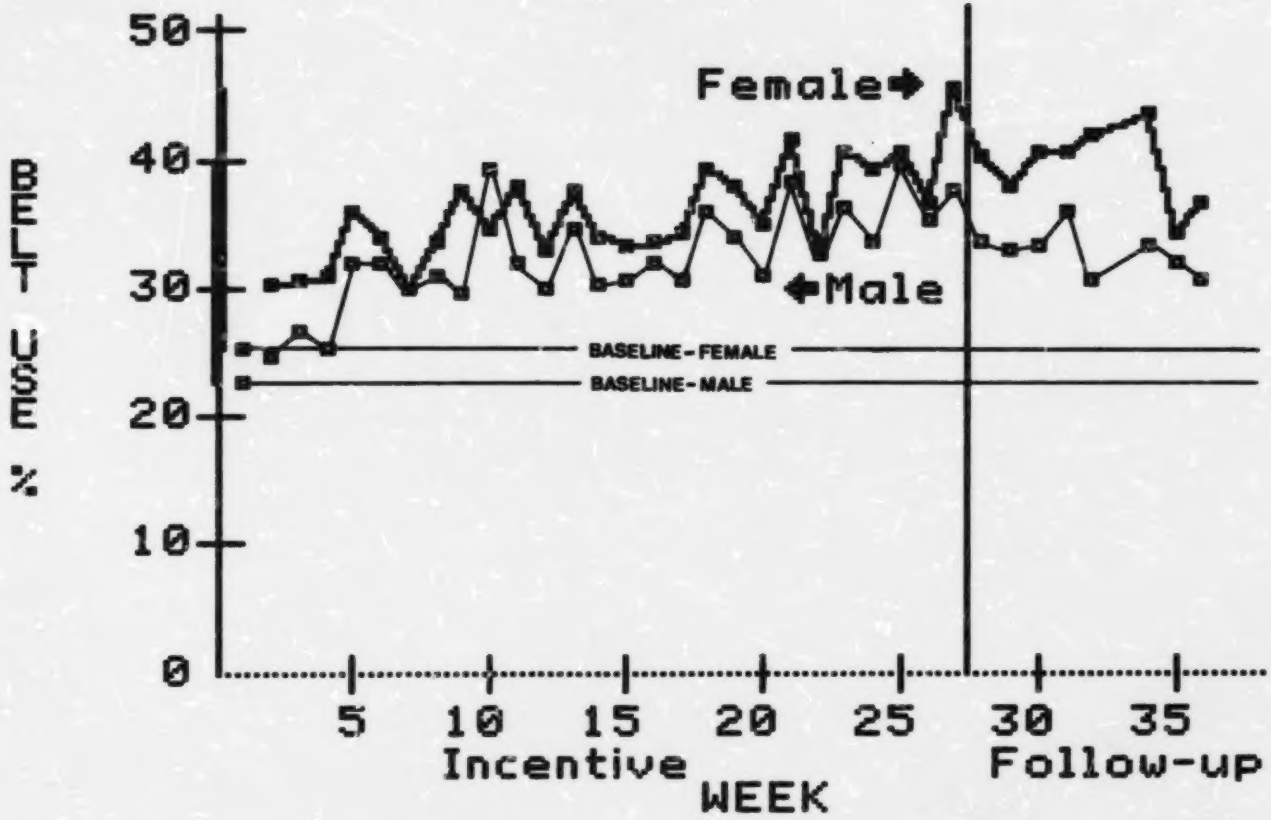

Figure 7.4. Weekly seat belt use by driver sex.

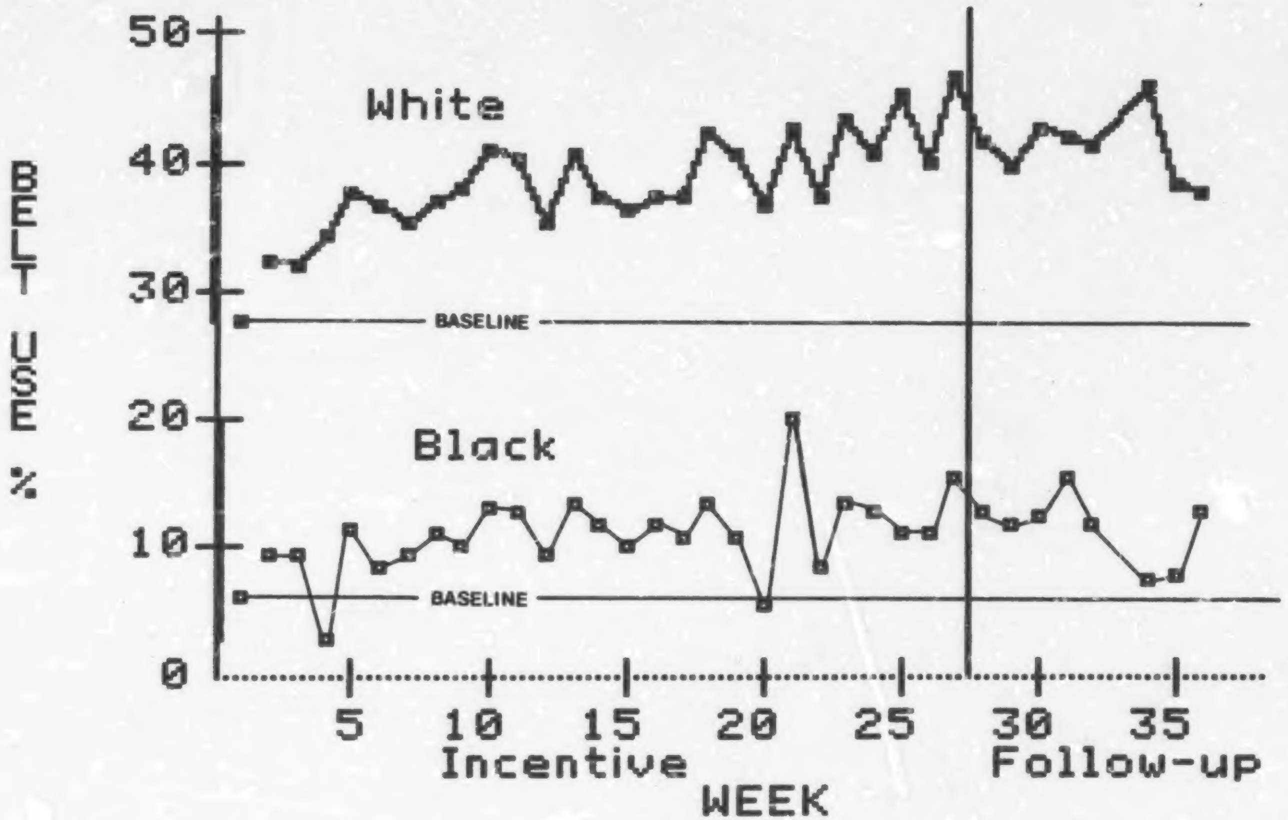

Figure 7.5. Weekly seat belt use by driver race.

black use rate peak was 20 percent about three-fourths of the way into the incentive phase.

While the plot for white drivers shows a clear, increasing trend over time, the plot for the black drivers shows a modestly increasing trend. These black/white differences are, of course, highly significant. Additionally, a model fitted to the black use data showed a significant increasing slope during the incentive phase. Based on this model, the black use rate increased about two-tenths of a percentage point each week, from 7.5 percent at the beginning of the incentive phase to 12 percent at the end of this phase a 60 percent increase. For the follow-up period, the black use has a decreasing slope, but the slope is non-significant (i.e., not different from zero). This finding is similar to that obtained for the follow-up period using all of the data.

Race and Sex Comparisons

When driver race and sex are combined (Figure 7.6), the use trends for white males and white females were significantly greater than those for black males and females. For both whites and blacks, the weekly female use rate tended to be slightly higher than the male use rate. The weekly use rate for white females was about three to four times the weekly use rate for black females. The same tendency was present for white versus black males, although the weekly differences were not as consistent. These male rate differentials were often greater than a factor of three to four. The peak values by race and sex were:

White females	50 percent
White males	40 percent
Black females	19 percent
Black males	21 percent

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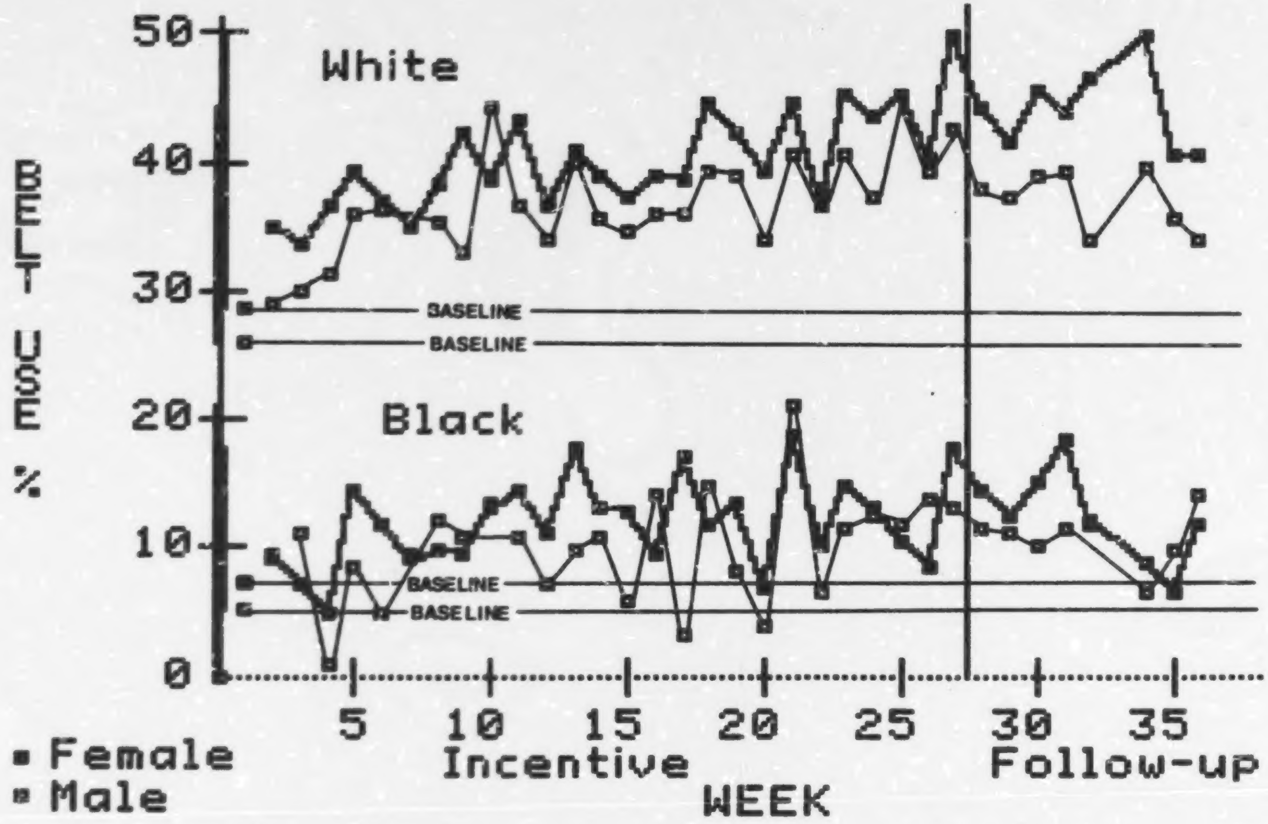

Figure 7.6. Weekly seat belt use by driver race and sex.

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Belt Use by Time of Day

There was modest variation in belt use related to the time the observations were made. During the baseline period belt use was highest during the morning rush hour and lowest in the off-peak afternoon observation periods. As shown in the table below the range was 6.3 percentage points.

Table 7.1 Belt use by time of day.

	Percent Belt Use	
Time of Day	Baseline	Later Incentive
A.M. Peak	26.7	37.1
Mid-Morning	22.1	33.2
Mid-Afternoon	20.4	35.0
P.M. Peak	23.4	37.8
Week end	25.3	37.5

Based on data from the second half of the incentive period, it is seen that growth took place at all the times observed, and that the overall range was smaller. In other words, usage was higher and more uniform in the later period. Even so, off-peak periods showed the lowest belt use. It seems plausible that during these times the nature of the trip might more often be a very short one from point to point inside the town. At rush hour, trip length might be greater. This would seem to be consistent with other belt use data. It is somewhat surprising that weekend driving, normally associated with leisure trips, showed such high belt use.

Belt Use by Day of Week

As can be seen from the table below, there is not a great deal of difference in belt use across days of the week, either in the baseline or in the incentive phase. However, the growth from baseline to incentive is evident.

Table 7.2 Belt use by day of week.

	Percent Belt Use	
Day of Week	Baseline	Later Incentive
Monday	25.5	30.9
Tuesday	24.1	37.5
Wednesday	23.7	37.8
Thursday	23.9	35.9
Friday	23.1	35.6
Saturday	26.9	37.8
Sunday	23.6	36.7

One anomaly seems to be the value for Monday in the incentive period. This may be an outgrowth of a happenstance of sampling. Usually the staff meeting to give out data observation assignments was held on Monday morning. This means that data were not collected on Monday as often, and it means that there rarely was morning peak data, a time of relatively high belt use, collected on Mondays. In any event, the data are consistent with the view that wearing a belt is largely a matter of habit; if one gets into the habit, then one is about as likely to buckle up one day of the week as another.

Belt Use by Smokers

In a given observation session, one might notice an instance or two of a driver in the act of smoking as he or she passed by. We could see the cigarettes, pipe, etc. In due course the impression was formed that these people were less likely to be restrained than the rest of the population. Thereafter, a decision was made to try to take a few observations. In all, 79 cases were noted in which the driver was in the act of smoking. In nine cases said driver was belted for a total of 11.4 percent of the cases. Perhaps the act of "lighting up" may take place in competition with the act of buckling up, when one is entering the car. Or perhaps being a smoker entails an approach to risk that is more nearly consonant with not using belts.

Belt Use in Local Accidents

Another indication of any benefits of the campaign would be an increase in belt use in local accidents. Such accidents are reported by Chapel Hill and Carrboro police using the standard state-wide form. This report form includes provision for recording belt use by all occupants.

Accident data tapes for several years were examined, and hand tallies of the most recent forms were made in order to have current belt use. Only Chapel Hill is included here because of a special effort in recent years to obtain comprehensive reporting of seat belt use. Carrboro is omitted because: (1) reporting of belt use in accidents is not as consistent, and (2) a considerably lower number of accidents leads to a large amount of month-to-month variation.

Table 7.3 shows bi-monthly belt use (lap or lap/shoulder) by drivers involved in Chapel Hill accidents from 1979 through October of 1983. Included are results from passenger cars only, since the population observations were so confined.

Table 7.3 Belt use in Chapel Hill crashes.

Year	Month	Number Belted Drivers	Total Number Drivers	Percent Belted
1979	1-2	43	207	21
	3-4	28	147	19
	5-6	21	118	18
	7-8	23	119	19
	9-10	29	168	17
	11-12	52	202	26
1980	1-2	29	140	21
	3-4	25	135	19
	5-6	20	98	20
	7-8	15	92	16
	9-10	29	136	21
	11-12	27	158	17
1981	1-2	24	156	15
	3-4	19	94	20
	5-6	17	91	19
	7-8	17	91	19
	9-10	31	165	19
	11-12	52	178	29
1982	1-2	39	167	23
	3-4	34	195	17
	5-6	38	138	28
	7-8	19	95	20
	9-10	47	187	25
	11-12	44	145	30
1983	1-2	49	187	26
	3-4	61	217	28
	5-6	55	163	34
	7-8	52	180	29
	9-10	95	261	36

As can be seen, the years 1979, 1980 and 1981 are rather similar, seeming to hover around 20 percent belt use in crashes. Further, in two of the three years there appears to be a higher use at the end of the year. This is one of the highest, if not the highest, belt use level in crashes for any town in North Carolina. Thus, this finding is consistent with the high population use rate noted during the baseline observations presented earlier.

The 1982 data suggest an upward trend, though the plot points are rather irregular (Figure 7.7). In 1982 HSRC began the first seat belt incentive campaigns at the local high school and the nearby state headquarters of the N.C. Blue Cross and Blue Shield company. Also in late 1981 we began to work with the Chapel Hill police, asking them to place special emphasis on reporting belt use in crashes they investigated.

The final three plotting points, representing the six months of the incentive campaign, are the highest use for the period shown (overall about 33 percent). Thus, the crash data seem to confirm the population observations showing increased belt use.

Lest it be thought that this increase might merely reflect a statewide trend, data from a few other locations around N.C. were similarly shown. These areas (towns and county areas near large towns) were selected because they showed the highest use rates in N.C. As can be seen, none showed a growth at the end except for "rural Durham County." Part of the town of Chapel Hill actually lies in Durham County.

All told, during the incentive period alone and counting only local Chapel Hill crashes, an additional 150 crash-involved drivers were belted beyond what would have been expected had the baseline prevailed. If the usual trend holds true, there were likely at least 50 more passengers belted as well. Thus, at least 200 additional crash victims were belted. This, of course, does not include any additional crashes that happened outside of Chapel Hill.

An item of interest is the reasonably close agreement of the belt use figures in the population and in the accident data. Usually when such comparisons are made, it is found that belt use in the population is at least twice as great as that in the comparable accident sample. One is tempted to interpret such differences as indicating that higher risk drivers, for whatever

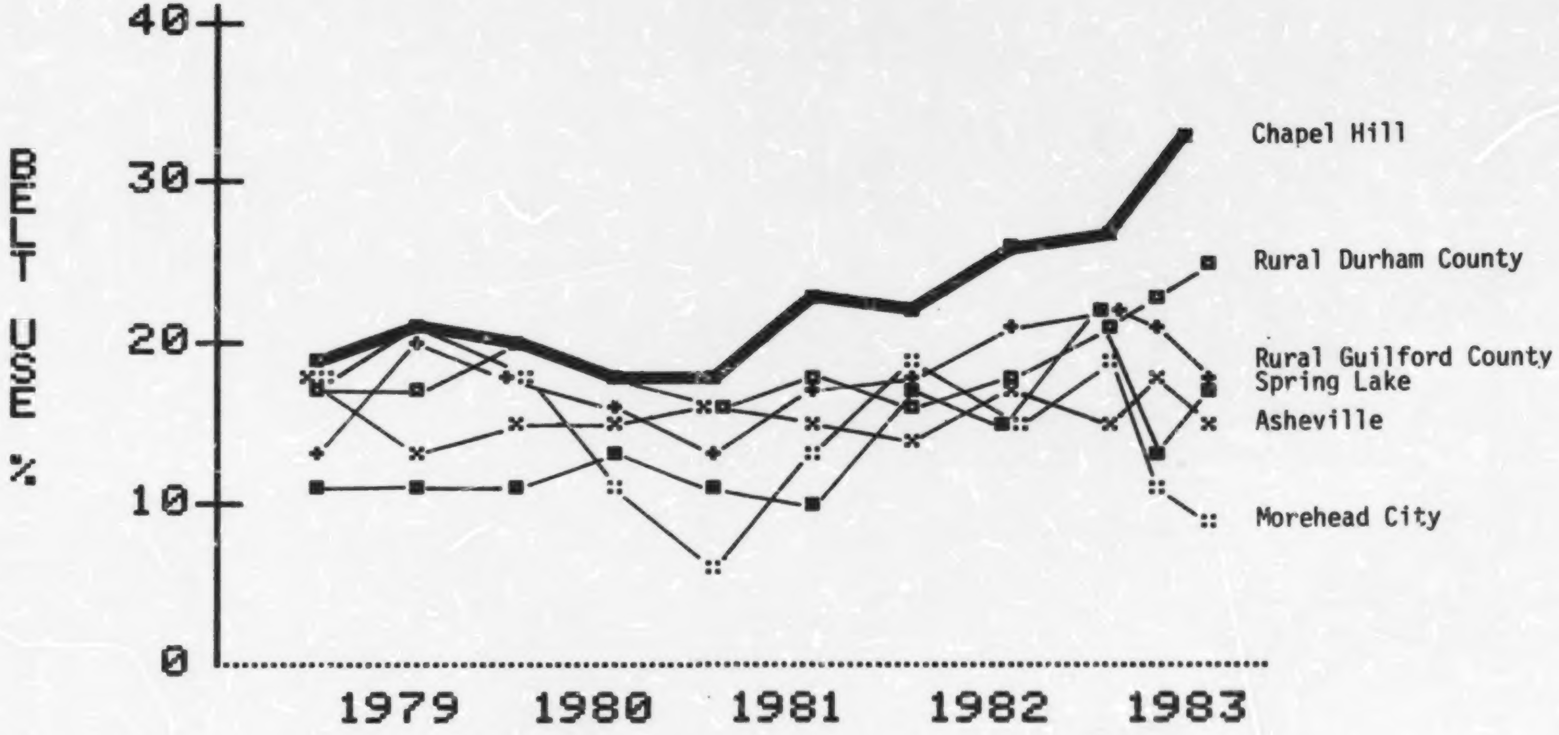


Figure 7.7. Plots of seat belt use in accidents by location.

complex of reasons, are less likely to wear belts. In this instance, it does not appear that this is as likely to be so. Nonetheless, there is no direct information to shed light on the similarity of belt use in the population and belt use in accidents.

Illustrative Accidents

During the project, several crashes came to our attention in which seat belts were used and appear to have prevented serious injury. As we learned of these crashes they were publicly highlighted as a part of the public education campaign. A feature of these crashes is the fact that they happened outside the local jurisdiction and therefore could not figure into the evaluation of crashes that happened in the Chapel Hill area.

Five crashes are mentioned here. Photographs of these cars were taken and HSRC staff were in some measure able to investigate the crashes and interview the victims.

Case 1: A Chapel Hill High School student was on his way to school for a pre-season football practice. He was lap belted in an older car, and skidded into a large tree which invaded the right front door to an extent of 1-2 feet He sustained bumps and bruises and a back laceration that was sutured. In the absence of belts he most likely would have been thrown into the tree itself with probable fatal consequences. This crash was of particular significance, since it was the seven high school student fatalities of recent years that prompted HSRC to pilot test this concept at the high school, and then later to try the effort on a community wide basis. We believe that fatality number eight was averted here. (Figure 7.8)

Case 2: A member of the UNC men's basketball team was lap/shoulder belted in a small foreign sports car involved in a rather severe frontal car-to-car crash. Despite the belts, he was momentarily unconscious from hitting the steering rim, and his right knee hit the lower instrument panel resulting in a laceration. The same knee had received surgery the previous year from an athletic injury, and the player missed part of the season from the previous injury. While this crash probably would not have been fatal even if the young man had not been belted, it seems likely that he would have sustained a disabling injury to the knee and would have missed the current basketball season. As it was, his injury was confined to the above-mentioned trauma plus the generalized body soreness that comes from the necessarily violent contact with the belts in the crash. (Figure 7.8)

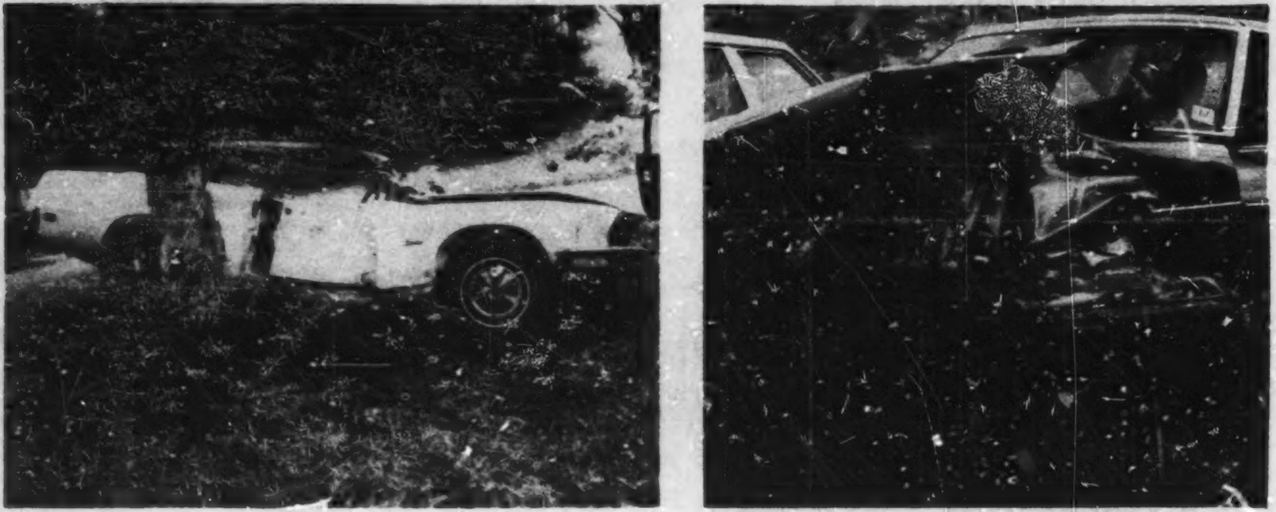


Figure 7.8. CASE 1 (left) and CASE 2 (right).

Case 3: This head-on crash involved a driver and right front passenger wearing the lap/shoulder belts in a small foreign car. The extent of vehicle deformation was extreme. Both parties believe they were momentarily unconscious. One suffered a broken bone in his hand. The other had a small cut on his head. Both reported generalized soreness. In the absence of belts they would almost certainly have sustained serious and possibly fatal injuries. (Figure 7.9)

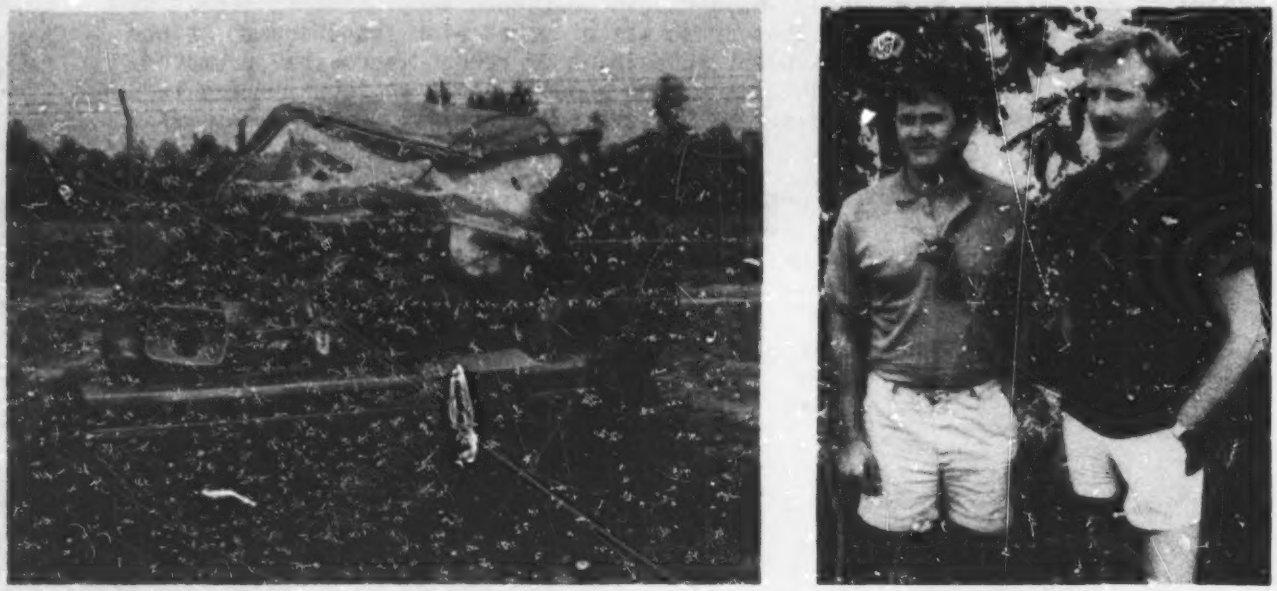


Figure 7.9. CASE 3.

Case 4: This crash involved a rollover of relatively moderate severity The lap/shoulder belted female driver was not injured. In the absence of belts the injury consequences would have become a matter of luck. The driver might not have been injured very badly at all, but there is also the possibility that she would have been ejected. (Figure 7.10)

Case 5: A local family of four was on a vacation trip. A head-on crash resulted in considerable vehicle damage. Two sons in the back seat were lap belted, and the parents were lap/shoulder belted in the front. According to the father all were belted because of the local campaign. The three males suffered relatively minor injuries. The mother in the right front seat sustained a fractured sternum, presumably from contact with the shoulder belt. It seems likely that since she impacted the belt with enough force to break the sternum, she would have struck the dash and windshield with even greater force had she been unrestrained, with even worse injuries resulting. (Figure 7.10)

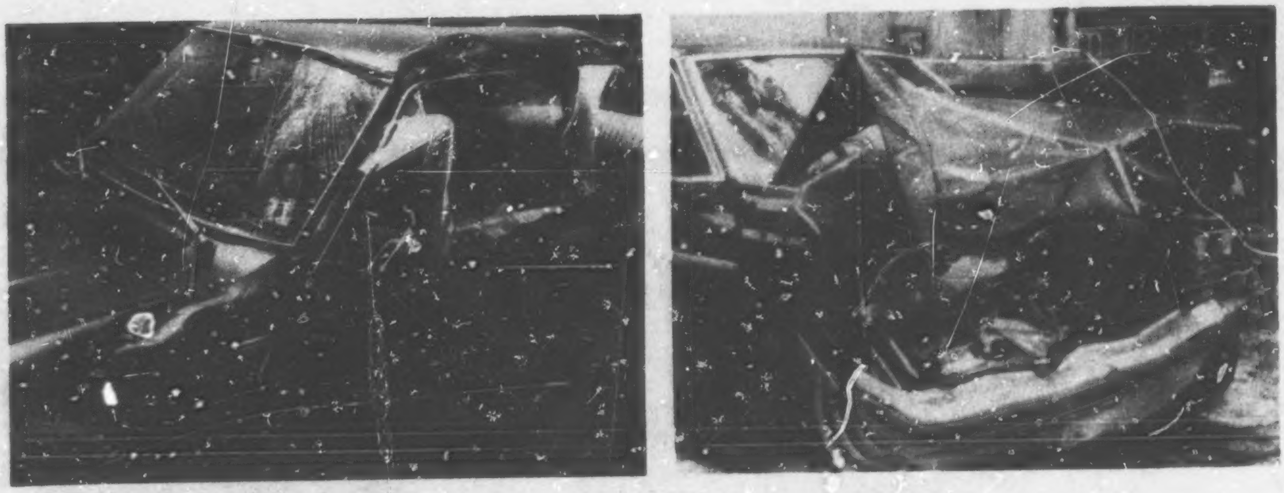


Figure 7.10. CASE 4 (left) and CASE 5 (right).

As was stated, there is no easy way to identify out-of-town crashes sustained by local people. Thus, this is currently an unmeasurable element of the impact of this project.

Additional Factors

Embedded within the results shown above are some institutional and corporate use policies that were either in place before the incentive phase started or took effect shortly thereafter. First, the pilot projects with Chapel Hill High School and Blue Cross and Blue Shield in the spring-summer of 1982 had resulted in increased belt wearing at these locations (see Chapter 2). The program at Chapel Hill High School was continued in the Fall '82 - Spring '83 school year, and prizes were given to students who were buckled up starting in the fall of 1982. These prizes were the result of a $250 grant from the Parent Teacher Student Association, along with about $750 donated by parents. Shoulder belt use at Chapel Hill High School was a cumulative 44 percent for the 1982-1983 school year, and 50 percent or higher with lap belts added in.

Blue Cross and Blue Shield also continued a seat belt incentive program using $2,000 specifically budgeted for their own staff to continue the effort. Five dollar coupons were given to employees wearing belts in vehicles randomly selected from the inbound or outbound traffic. This was done once or twice a month, compared to the daily giveaways prevalent in the earlier one-month pilot project. From a baseline use rate of eight percent and a follow-up rate of 25 percent measured during the pilot project in 1982, the Blue Cross and Blue Shield use rate measured at the beginning of their own campaign was 25 percent. In other words, the follow-up use rate measured at the end of the pilot project had actually been maintained for a complete year in the absence of any incentives or other promotional materials! Although peaking around 50 percent (which corresponded to $5 giveaways as part of the $2,000 total), the Blue Cross and Blue Shield use rate tended to hover between 25 and 30 percent during the course of the community wide project. As previously reported, the rate had peaked at approximately 70 percent during the intensive pilot effort.

CHAPTER 8. DISCUSSION

Project Successes

Project success was rather evident and can be documented in several ways. In the baseline period local belt use was 24 percent -- higher than the national average of 14 percent. During the incentive phase, belt use grew rather steadily, reaching a high of 41 percent during the final week of the six-month incentive phase. Indeed, there is no evidence in the incentive phase data that the growth in the use rate was abating. To the best of our knowledge, the only figure comparable is 42 percent recorded for the community of Franklin, Michigan, at one stage of a Detroit area campaign several years ago (Nichols, 1982).

Other indications of project success include the amount of support from the local business community, the extensive media support, and the general spirit of enthusiasm and participation on the part of community citizens. One reason for the initial success is that the underlying approach operates in harmony with important principles of human behavior. Thus, the vast majority of people like positive recognition for their efforts, whether in a work or social setting. The same applies to creating or developing a seat belt habit -- positive reinforcement can lead to productive change. An indication of community involvement is the fact that of the 7460 entry cards given out, 6003 (80.5%) were returned for the drawings.

Chapel Hill/Carrboro's increased belt usage also had a pay off in terms of increased protection for those involved in automobile crashes. Thus we were able to estimate that 200 extra people were belted in local crashes only during the six-month campaign.

Project Failures

The greatest threat to the success of this approach is for a project to suffer from insufficient visibility. Insufficient visibility includes having too few incentives to give out and a lack of continuing publicity.

While the media attention and promotion were excellent, in an appreciable portion of vehicles stopped the occupants were still not familiar with the campaign. (Some unbelted people perhaps claimed to be unaware of the campaign due to embarassment, although the prevalence of such a response is unknown.)

The most visible failure of the project was the scant impact the effort made on belt use rates among the black members of the community. While the use rate significantly increased for black citizens as well as white citizens, the residual differences in wearing rates was large -- three to four fold.

Specific efforts were made to reach members of the black community by ensuring that radio messages were aired on local radio stations with significant black listenership, including an hour-long talk show. Black community leaders participated in the radio spots. Prizes were awarded in all parts of Chapel Hill/Carrboro which included predomninantly black neighborhoods, shopping areas, etc.

Nonetheless, the project had inadequate impact with the local black community. HSRC recommends as an urgent priority that a research project be carried out designed expressly to develop and validate belt promotion strategies that will work well in black communities.

This project was also not totally successful in persuading organizations to initiate belt use policies. Although usage was mandated by several local agencies, the Carrboro Police Department declined to institute such a practice. The University also took no action toward a review of whether such a belt use policy would be advisable.

Will the Effect Last?

An immediate question is whether the belt use gains will be permanent. The answer is there certainly will be slippage. Previous studies in closed settings confirm a slippage, but indicate some residual gain. This is not fully known for the present study and will not be for several months. Certainly we have seen a drop of seven to eight percentage points from the peak. At this point, it is not known whether the decline will level off with a net gain. The data that will be collected over the next year will provide answers to some of these questions.

One point worth discussing is the degree of community "ownership" of a project and what effect this might have on any belt use decline. While many segments of the community (such as media, business, etc.) participated in this campaign, staff from HSRC gave out virtually all of the thousands of incentives. This was done to maintain a high level of effort and also to impose controls necessary for proper program implementation and evaluation. However, one might speculate that there would be utility in having many different "faces" in the community taking part in the effort.

In a larger sense, any effort to change behavior will wane if program emphasis is removed or diminished. Certainly this is true in enforcement efforts against speeders or drunk drivers. To sustain voluntary belt use at a reasonably high level will probably require a variety of programs and a continuing effort. This necessity of continued effort is accepted in areas like speed control, drunk driving countermeasures, vehicle inspection, etc. The same ongoing effort must begin in the area of occupant restraints.

The potential for payoff is particularly high in the seat belt area, because effectiveness levels have been well established. In some other areas of highway safety programming that are currently being pursued, there is little evidence for effectiveness of even a temporary nature, let alone permanent effects. In contrast, belt use increases will translate directly into saved lives and reduced injuries. Accident data show that the proper use of seat belts could save as many as two out of every three people dying unbelted in crashes in the U.S.

Plans for the Future

In addition to the continued weekly monitoring of seat belt use rates, a survey is planned in Chapel Hill and Carrboro to ascertain which aspects of this multiple intervention campaign had the greatest impact in effecting behavior change. For those who began wearing seat belts as a result of the campaign it will be important to know what factor(s) led to the change. Did the change result from:

- the incentives?
- the heightened public awareness?
- the cash drawings?
- personal accident testimonies?
- an earlier or recent accident experience?
- etc.?

Information on what components were the most influential will be important to consider in planning future incentive efforts.

It will be of even greater importance to learn why those familiar with the campaign neglected to begin a habit. Reasons provided will undoubtedly suggest alternative stragetics for future efforts.

Questions will be designed to elicit responses that let researchers know how many people were reached, who was missed and why. All should provide valuable information for those involved in the design, implementation and evaluation of future incentive efforts to increase restraint use.

Recommendations for Replication of This Effort

The authors believe it is feasible to administer incentive programs to increase seat belt use, and that these programs can vary greatly in scope, target audience and procedure, and still be successful. However, some limitations should be considered.

In order for a community wide program to be successful, enough incentives must be available, in some reasonable combination of number and magnitude, such as to create the perception of a reasonable chance of winning. Project "visibility" must be high enough to keep people thinking about the effort. Project publicity must be extensive. This points to the use of a variety of media, as well as interpersonal "networking" to "get the word out" to all segments of the community. In order for belt use to become habitual, continuous reminders and reinforcement need to be present.

Thus, those planning a project of this nature need to assess the target population in question (including size, sub-groups, etc). Once the community makeup has been determined, one can assess the chances of obtaining the necessary publicity and incentives in light of the size and heterogeneity of that target population. To that end, perhaps the best recommendation would be to seek the heavy involvement of a media group. As in the case of this project, this can help immeasurably in obtaining incentives and giving the project intensive publicity. The present scheme seemed to work rather well in a community of 50,000, but a different scale of operation might be necessary in a larger urban area.

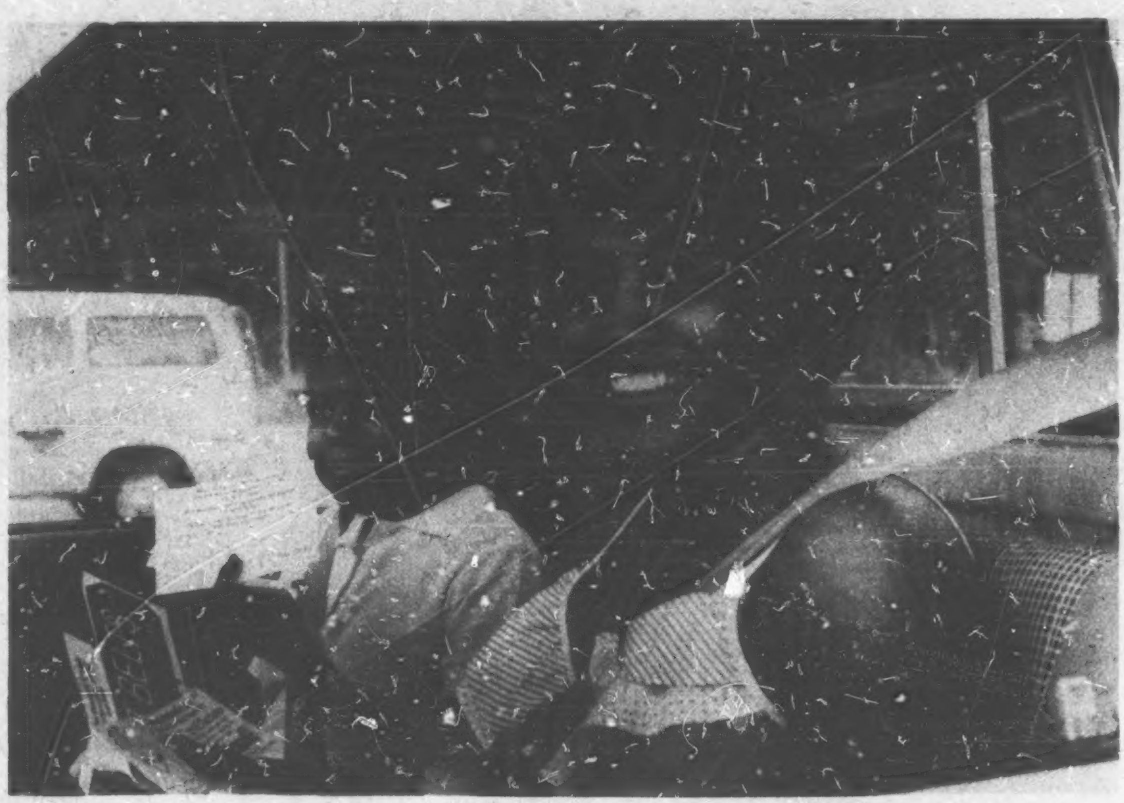
To operate in Chapel Hill, this project required the equivalent of two full time persons over a period of a year. The educational component and media promotion required extensive effort and were especially time-consuming. This community effort was particularly labor intensive because of the research nature of the project, which entailed more elaborate belt use monitoring than would otherwise have been necessary. However, even in the absence of that requirement, this project undoubtedly exceeded the amount of effort that would be feasible for a community group or civic club that wanted to undertake the effort as a group project.

Given the intensity of the labor requirements for a community project, it may be more appropriate for a community group to undertake an incentive project in a high school or other "closed" setting. Thus, to retain the enthusiasm of project staff, and to give everyone a feeling of having succeeded, it is important to tailor the size of the target population selected to the resources available.

Availability/Lack of Resources for Incentive Projects

For this approach to work in a limited research setting is one thing, but it is quite another to contemplate whether this approach is feasible over large areas of the U.S. If the 1980's is to be the decade in which the U.S. joins many other countries addressing the restraint issue effectively, then it follows that several approaches will be required. No one approach will provide "the solution." Therefore, the need will remain for child restraint programs, child restraint laws, voluntary adult use programs, corporate and government on-the-job use policies, adult restraint laws, and automatic restraints -- all of these components!

Automatic restraints, for example, cannot be on the scene for several years. If airbags are the approach chosen during the second half of the 80's, they will show limited effectiveness unless belt use is increased. It also seems likely that several years will pass before any appreciable number of states pass adult restraint laws, even though the first such enactment may come in the next one to three years. One of the factors that presumably must be present before a seat belt law can be passed is to have at least a nucleus of citizens who wear belts and tacitly agree that such a law could be beneficial. Incentive programs are one way to start building toward that goal.



Seat Belts Pay Off!

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APPENDIX

EDUCATIONAL AND PROMOTIONAL MATERIALS

APPENDIX A-1

UNC Highway Safety Research Center-Radio Messages

Wearing seat belts can save your life and win you prizes. To help you get in the regular habit of wearing seat belts, the UNC Highway Safety Research Center is giving away thousands of prizes to belt wearers in Chapel Hill/ Carrboro. So, buckle up. Seat belts pay off.

Traffic accidents are the leading cause of death for people under 34 years old. Even for people over 34 years of age, traffic accidents account for a tremendous toll. Buckling up when you ride is the single most effective thing you can do to increase your chances of escaping serious injury or death in a crash.

People give lots of excuses for not wearing seat belts, some based on dangerous myths. Some people think it's better to be thrown clear of the car. NO, in fact it's many times worse. "Thrown clear" often means being thrown through broken glass, onto the pavement or into the path of another car. The best place to be in an accident is in the car with your seat belt on! Seat belts pay off.

Recently, the problem of drunk drivers has received a great deal of national, state and local attention. The best way for you to avoid becoming a drunk driver's victim is to wear your seat belt. You can't predict other driver's actions, so ride defensively. Seat belts pay off.

If you buckle up your child but not yourself, you're missing the point. North Carolina has a law requiring that most young children be safely restrained while riding in cars. Think about it. Children need to be protected, but they need you to be protected too. Seat belts pay off.

Even if you are only driving at 30 miles per hour, you could be killed in a traffic accident. We've all heard that many accidents happen close to home, and, in fact, seventy five percent occur within twenty five miles of the victim's home. The good news is that if you are wearing your seat belt, you have virtually no chance of being killed. The University of North Carolina Highway Safety Research Center asks you to remember: Seat belts pay off.

Women often ask the question, "Should I wear my seat belt if I am pregnant?" The answer is YES, and here's why. By wearing your seat belt you are protecting your baby. The most serious risk to your unborn baby is that you will be injured. So buckle up for yourself and your baby. Seat belts pay off.

Seat belts pay off. They can prevent most deaths in automobile crashes. But seat belts lose much of their effectiveness if worn improperly. Wearing the belt right is a two step process. The lap belt should be as low and as snug on the hips as possible. The shoulder belt should come over the shoulder with just a little slack for comfort. Too many people wear the shoulder belt under their arm instead of over their shoulder. Please wear your seat belt properly for added safety.

Seat belts pay off by reducing serious injury and preventing deaths. Sometimes we hear false statements about seat belts. You may hear of an accident in which someone was supposedly lucky not to be wearing a belt. However, close examination of traffic accidents indicates that it is virtually unknown for the belt to make the situation worse. PLEASE, wear your seat belts. If not for yourself, then for your loved ones.

In this period of high driving costs, more and more people are choosing smaller vehicles as their means of transportation. That's OK, but drivers of small cars should realize that from an accident standpoint, they are at increased risk of injury when compared to drivers of larger vehicles. No matter what size vehicle you drive or ride in, please wear your seat belts. Seat belts pay off.

Do you know what happens when a large car and a small car crash into each other? Well, it's like the old physics principle-the larger car comes out ahead. One of the best things you can do as the driver or passenger of a small car is to always wear your seat belts. Think about it. If you're not wearing a seat belt, what's holding you back?

People give lots of excuses for not wearing seat belts. Some say, "My car might catch on fire and I might be trapped." NO, odds are thousands to one that it won't catch fire. AND if quick escape is necessary, you are more likely to be conscious and able to get out of the car, if you are wearing your seat belt. Seat belts pay off.

☆U.S. GOVERNMENT PRINTING OFFICE: 1985 491 810 20564

SEAT BELTS PAY OFF

WEARING BELTS CAN SAVE YOUR LIFE

WEARING BELTS CAN WIN YOU PRIZES

TRAFFIC DEATHS

Traffic crashes are the leading cause of death for age groups under 34 years old. Yes, the leading cause, ahead of every other cause.

For those over 34, crashes are still a major cause of death.

We may dismiss those statistics because riding in a car feels so safe. And that's right. Trip by trip it is pretty safe, but in years of driving the chances of a serious crash are great.

SEAT BELTS PAY OFF IN LIVES SAVED

Buckling up when you ride is the single most effective thing you can do to increase your chances of escaping serious injury or death in a crash.

Belts can save 200 of every 300 now dying unbelted and can reduce serious injuries, too. That can translate into hundreds of lives saved each year in North Carolina.

Not wearing belts results in as many highway deaths as drunk drivers cause!

BELT USE IS TOO LOW!

The bad news is that in the U.S., only about 10% of people buckle up. Here in Chapel Hill/Carrboro, the rate is 20%-higher than most other places, but still not much to brag about.

WHY IS IT LOW?

People give lots of excuses for not wearing belts, some based on dangerous myths.

"It's better to be thrown clear of the car."

NO, in fact it is many times worse. "Thrown clear of the car" often means being thrown through broken glass, onto the pavement, or into the path of another car.

"My car might catch on fire, and I'd be trapped".

NO, odds are thousands to one it won't catch fire.
AND if quick escape is necessary, you are more likely to be concious and able to get out of the car, if you are wearing your seat belt.

Maybe the main reason we don't wear belts is that we just don't think about it. Let's start thinking about it, Chapel Hill/Carrboro.

Let's make wearing belts a community habit.

SEAT BELTS
Wearing Belts Can Win You Prizes.
Wearing Belts Can Save Your Life.

SEAT BELTS PAY OFF IN CASH PRIZES

To help you get into the regular habit of wearing belts, we are going to give thousands of prizes to belt wearers.

HERE'S HOW YOU CAN WIN

University of North Carolina representatives (from the Highway Safety Research Center) will appear several times a week at various places around town ready to give belt wearers a prize.
For example, at a parking lot exit, we will randomly select exiting traffic. All who are belted in the selected car will receive:

1. A coupon redeemable for cash or a gift at a named merchant's location

AND

2. A chance for a monthly drawing AND a chance for a grand prize drawing

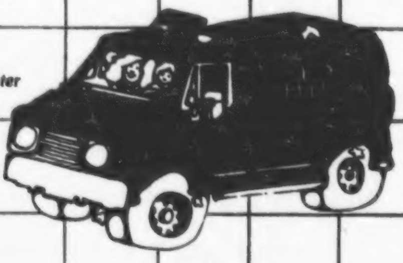
The more times you are belted the more times you can win.

The contest will last from April-October 1983 and is co-sponsored by:

The University of North Carolina Highway Safety Research Center
The North Carolina Governor's Highway Safety Program
The General Motors Corporation
The Village Companies

The project is also endorsed by:

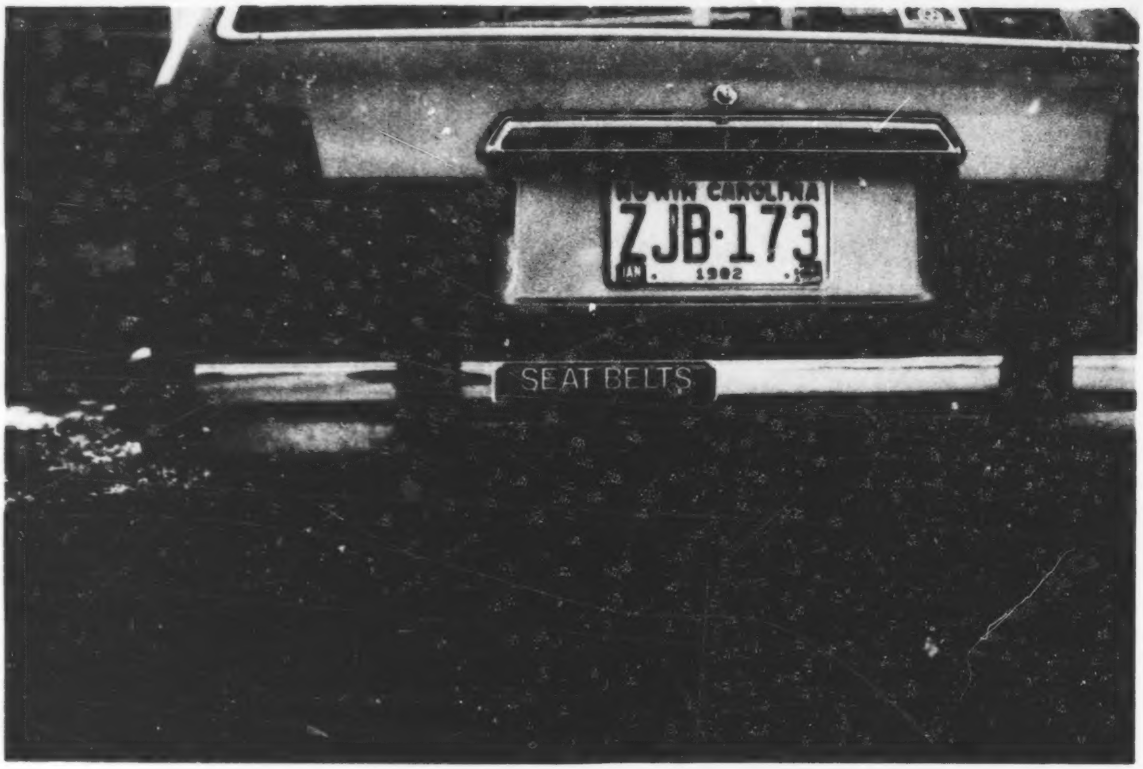
Citizens for Safe Driving
The Town of Chapel Hill
The Town of Carrboro
The Greater Chapel Hill/Carrboro Chamber of Commerce



BEST COPY AVAILABLE

A-3

Bumper Sticker


NORTH CAROLINA
ZJB·173
JAN
1982
SEAT BELTS

A-4

Contest Flier

SEAT BELTS PAY OFF

Between now and October 15th
you can win cash and prizes for buckling up!

$1000 Grand Prize
$500 Monthly Winners

and thousands of coupons for cash and merchandise

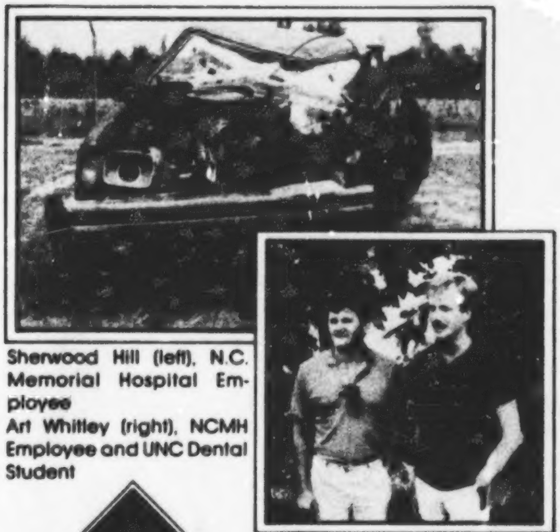
Seat Belts Have Already Paid Off for These Chapel Hill/Carrboro Residents

Donald G. McLeod
$500 WINNER

Vickie Ann Weaver
$500 WINNER

Evelyn C. Ricker
$500 WINNER

Seat Belts Also Paid Off In These Recent Accidents
By Preventing Serious Injuries



Sherwood Hill (left), N.C. Memorial Hospital Employee
Art Whitley (right), NCMH Employee and UNC Dental Student

Mary Lucas, UNC Family Medicine

William Morris, Town of Chapel Hill Employee, Marion Morris and their two sons

SEAT BELTS

WEARING BELTS CAN SAVE YOUR LIFE
WEARING BELTS CAN WIN YOU PRIZES

A-5

Postcard

I Was Wearing My Seat Belt!
And I Have A Chance To Win
Cash Prizes

If I Am One Of 6 Monthly Winners
I'll Win $500!

If I Am The Grand Prize Winner
I'll Win $1,000!!!

(Please print clearly)

Name ______________________________

Home (local) Address ______________________________
Street

________ ________ ________
City State Zip

Work Address ______________________________
Name

____
Street

________ ________ ________
City State Zip

Telephone Numbers ______________ ______________
Day Evening

SEAT
BELTS
PAY-OFF

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 44 CHAPEL HILL, N.C.

POSTAGE WILL BE PAID BY ADDRESSEE

UNC Highway Safety Research Center
Craige Trailer Park 197-A
University of North Carolina
at Chapel Hill
Chapel Hill, NC 27514

APPENDIX A-6

BIOGRAPHICAL SKETCH OF EACH $500 CASH WINNER

The first winner (May 1) was Evelyn Ricker, a 73 year old white female and retired church secretary. She had been stopped in a grocery store parking lot in April. Ms. Ricker is a widow who planned to buy a lightweight sewing machine with some of her money. After her husband died she sold her old machine since it was too heavy for her to lift.

On June 1, Vickie Ann Weaver, a 34 year old black female teacher's aide, was the winner. Ms. Weaver was stopped on her way to school one morning. Her classroom of children were thrilled with the fact that she had won, and they suggested all sorts of plans for her money.

The third winner, Donald McLeod, a 62 year old white male salesman, was stopped at the Chapel Hill post office in June, immediately mailed in his card and won on July 1. Mr. McLeod said that the campaign had helped him to remember to buckle-up all the time. As the driver of a small car, he felt it was especially important to wear his seat belt.

The fourth winner (August 1) was Maxine Hartford, a white female who works in the printing department of N.C. Memorial Hospital. She and her 15 year old daughter were stopped at a Chapel Hill convenience store. Since they were stopped together, Ms. Hartford shared her money with her daughter.

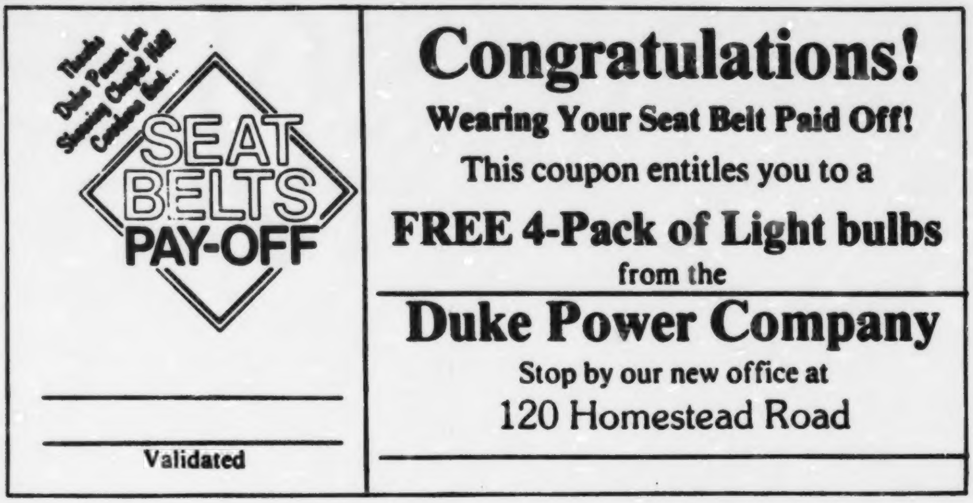
On September 1, Barry Weston, a white male employee at the Orange Water and Sewer Authority won $500. Mr. Weston was stopped at a Carrboro Day Care Center while he was dropping off one of his children. He decided to donate his $500 prize to the parochial school his older son attends.

The last $500 prize was awarded on October 1 to Marshall Jenkins (25 year old white male). He is a UNC graduate student. Marshall was stopped during the month of September on a Saturday when he was driving into a Chapel Hill building supply store parking lot. He and his wife, who is also a UNC graduate student, planned to buy a washing machine with part of their money.

Everyone who had mailed in a postcard at anytime during the campaign was then eligible for the $1,000 grand prize to be awarded on November 2. The final winner's name was drawn from among the 6003 cards mailed in. Since 7460 were given out this is a gratifying 80 percent return rate. Susan B. Wood (white female) a Chapel Hill housewife and mother was the $1,000 winner. Ms. Wood had been stopped while picking up her son at his Junior High School in April. She planned to travel with her money after sharing some with her son.

A-7

Sample of Award Coupons



Thanks
Duke Power for
Steering Chapel Hill
Carolina [illegible]...

SEAT BELTS PAY-OFF

Validated

Congratulations!

Wearing Your Seat Belt Paid Off!

This coupon entitles you to a

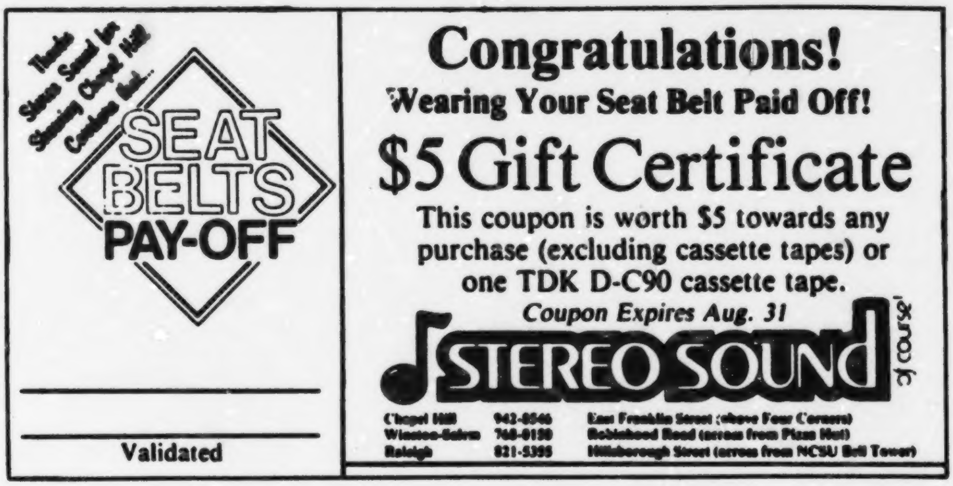
FREE 4-Pack of Light bulbs

from the

Duke Power Company

Stop by our new office at

120 Homestead Road



Thanks
Stereo Sound for
Steering Chapel Hill
Carolina [illegible]...

SEAT BELTS PAY-OFF

Validated

Congratulations!

Wearing Your Seat Belt Paid Off!

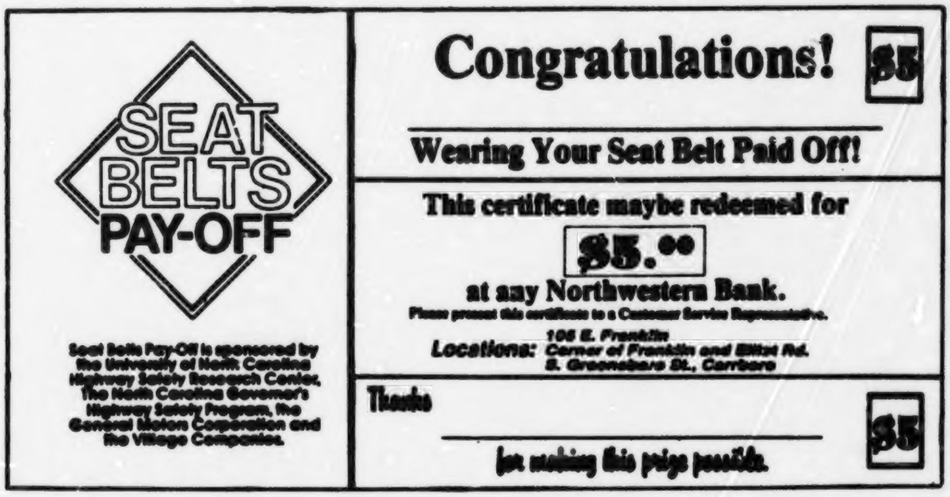
$5 Gift Certificate

This coupon is worth $5 towards any purchase (excluding cassette tapes) or one TDK D-C90 cassette tape.

Coupon Expires Aug. 31

STEREO SOUND of course!

Chapel Hill 942-8546 East Franklin Street (above Four Corners)
Winston-Salem 768-0150 Robinhood Road (across from Pizza Hut)
Raleigh 821-5395 Hillsborough Street (across from NCSU Bell Tower)



SEAT BELTS PAY-OFF

Seat Belts Pay-Off is sponsored by the University of North Carolina Highway Safety Research Center, The North Carolina Governor's Highway Safety Program, the General Motors Corporation and the Village Companies.

Congratulations! $5

Wearing Your Seat Belt Paid Off!

This certificate maybe redeemed for

$5.00

at any Northwestern Bank.

Please present this certificate to a Customer Service Representative.

Locations: 105 E. Franklin
Corner of Franklin and Elliott Rd.
S. Greensboro St., Carrboro

Thanks

for making this page possible. $5

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